THE JOURNAL OF GAS LIGHTING
WATER SUPPLY & SANITARY IMPROVEMENT

VOL. LXXI. No. 1828.] LONDON, MAY 24, 1898. [50TH YEAR. PRICE 6d.

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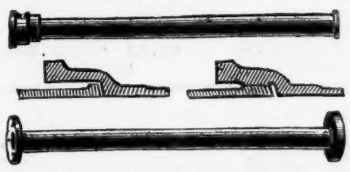

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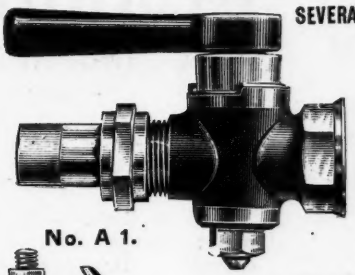

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FULL-WAY

AS SHOWN.

SUPERIOR QUALITY AND FINISH IN GUN METAL.

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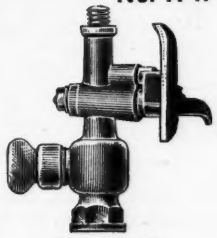

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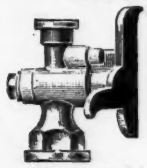

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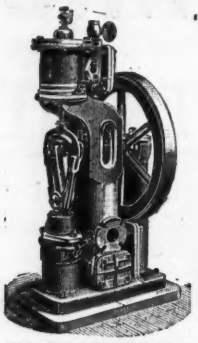

Fig. 705. "SINGLE RAM" STEAM-PUMP.

Fig. 598. "CORNISH" STEAM-PUMP FOR BOILER FEEDING, &c.

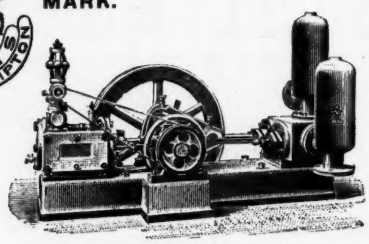

Fig. 685. "RELIABLE" STEAM-PUMP FOR TAR AND THICK FLUIDS.

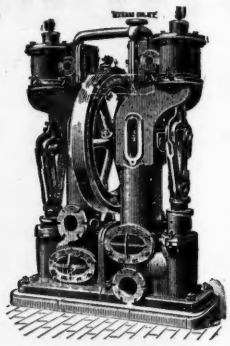

Fig. 712 "DOUBLE-RAM" STEAM-PUMP.

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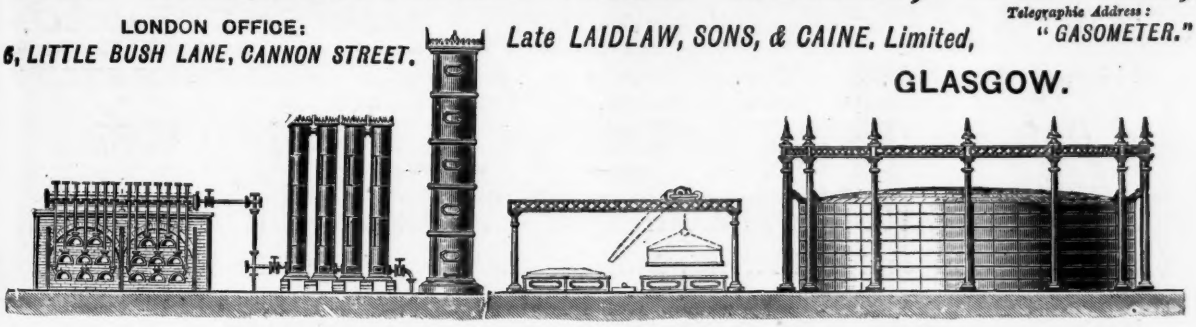

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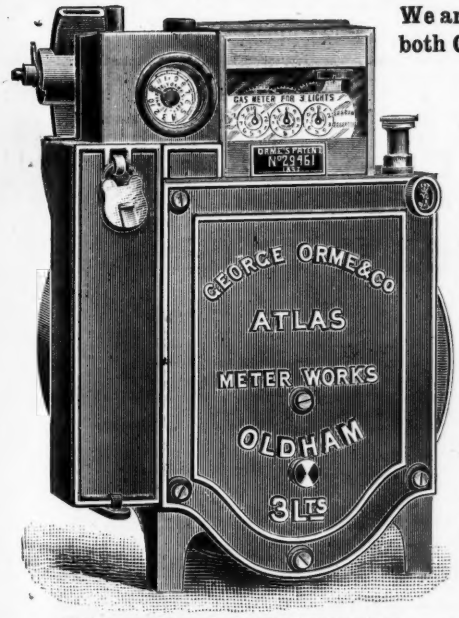

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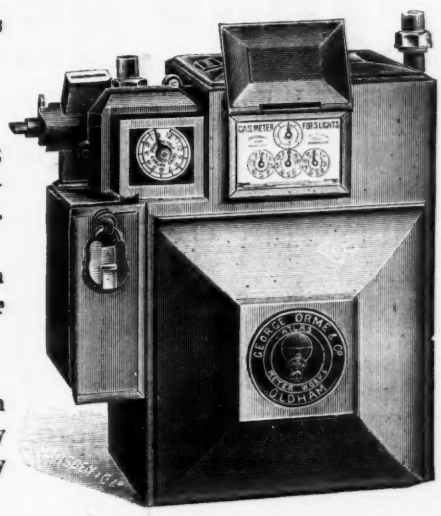

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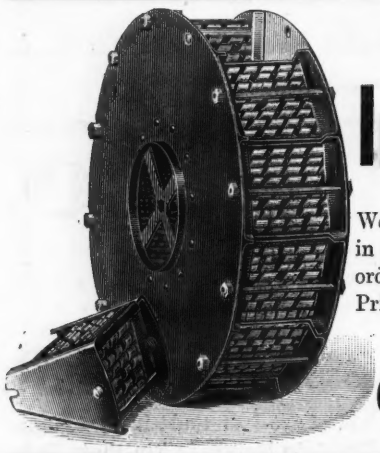

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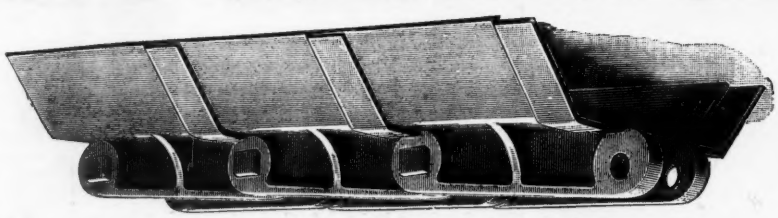

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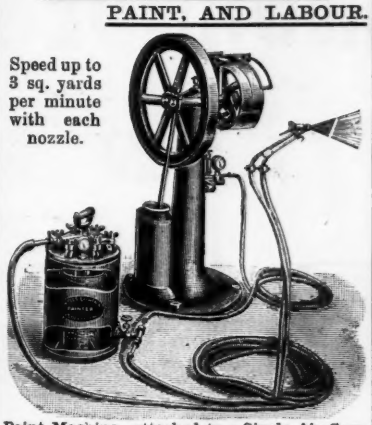

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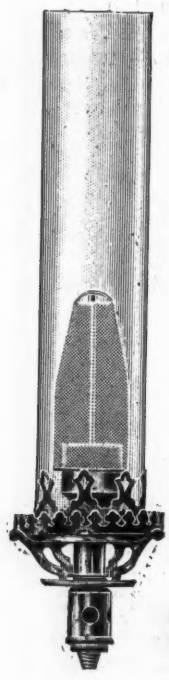

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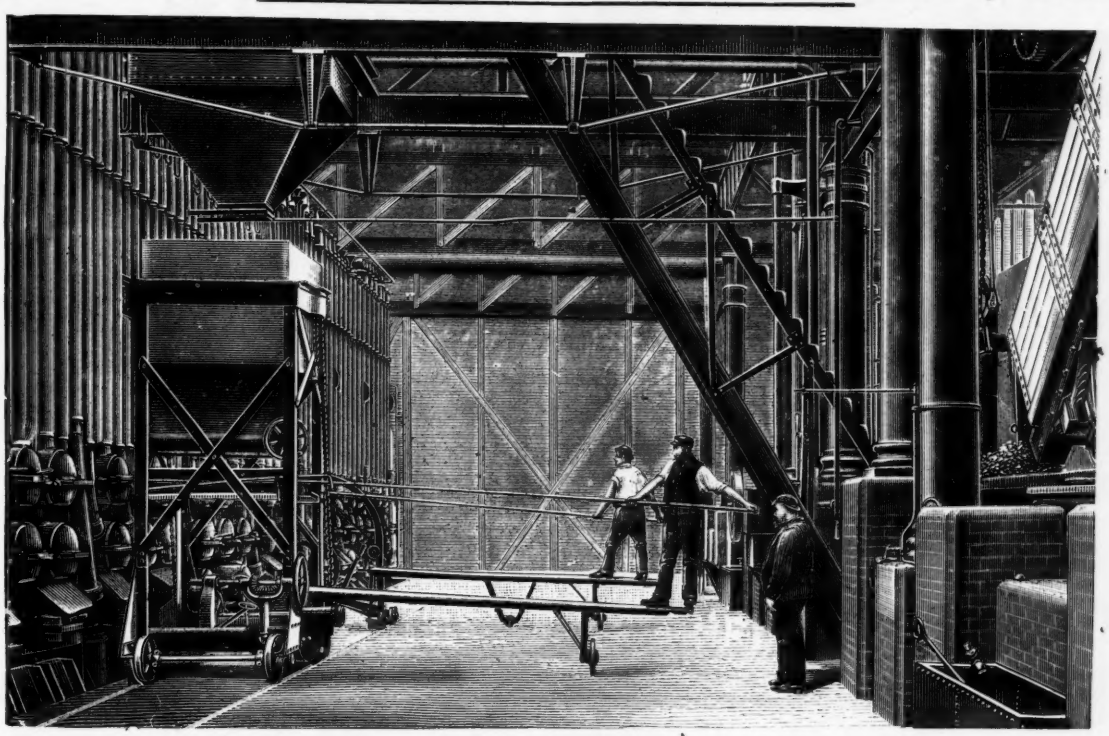

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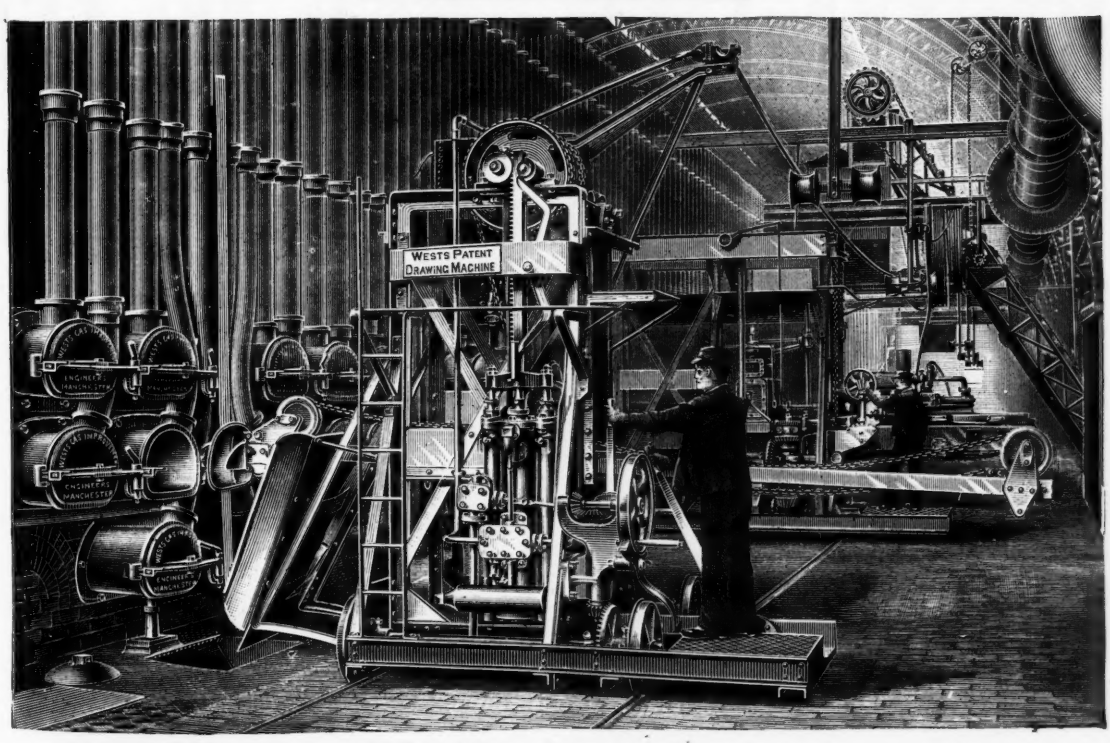

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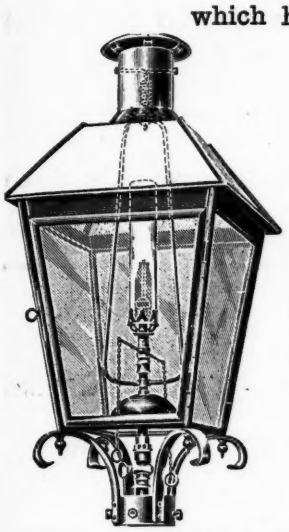
(Welsbach System),

which has now been successfully adapted to the purposes of



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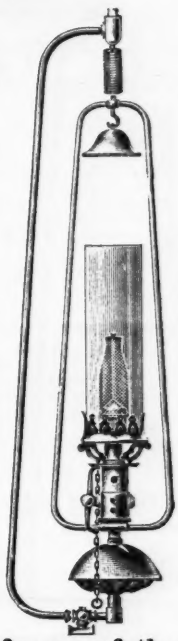

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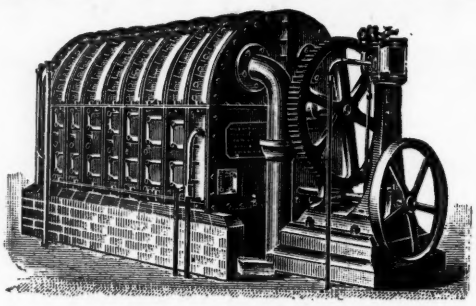

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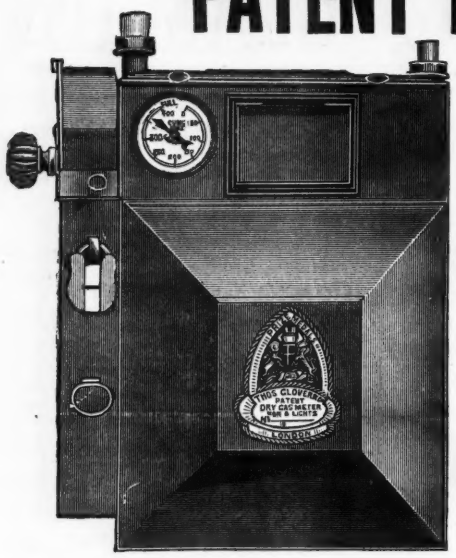

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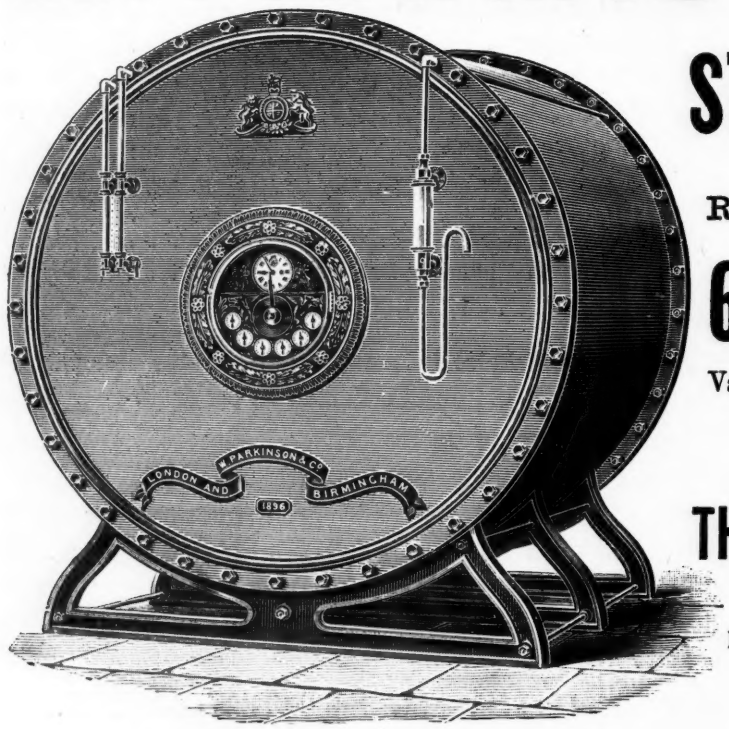

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EDITORIAL NOTES.

Proposed New Gas Companies' Association.

IT will be seen from a letter which we publish to-day that a meeting of representatives of Gas Companies has been arranged for Tuesday, the 7th prox., with a view to considering the desirability of resuscitating the Gas Companies' Association, or of forming a new organization with the same object, but subject to such modification of form as may be deemed desirable. Mr. George Livesey has consented to preside over the meeting, the cause being one which he has always favoured. We are desired to bring the matter before our readers' notice and to make it clear that failure to receive a circular-letter of invitation should not debar any gas manager interested in the subject from attending the meeting, which it is desired to make as representative as possible. The idea of those who are moving in the matter is that at the meeting the question of the expediency of forming an Association of Gas Companies for mutual protection against hostile parliamentary action, and for the dissemination of information concerning such action, will first be discussed. If the question receives an affirmative answer, a Provisional Committee will be nominated with instructions to consider how best to carry the proposal into effect. It should be distinctly understood that it is not intended that the Association should interfere in any way with the existing relations between Gas Companies and their legal and parliamentary advisers. Though the interval is short, we shall be pleased to receive our readers' views respecting the suggestion. Mr. Livesey probably lends his support to the preliminary proposal merely because he is an advocate of combined action by Gas Companies for almost every purpose. The first difficulty that occurs to one as likely to stand in the way of a successful issue to the present movement is the fact that Gas Companies no longer command all the parliamentary or other interest attaching to gas supply under statutory conditions. There are the municipalized undertakings to be considered. Next, how far is the official purview of such an Association as that proposed to extend? Is it to be a sort of Liberty and Property Protection League, confined to statutory Gas Companies? These and many other questions may be asked, not with any intention of throwing cold water upon the suggestion, but merely to clear the ground. The resuscitation of a perished organization is usually no easy task. Where the soil has failed to support a growth, it is a desperate endeavour to plant another specimen of the same order. It is in general better to make an entirely fresh start; and if the ground can be shifted, so much the better. At any rate, the meeting can do no harm, and may result in good if it is well attended and inspired with the proper spirit.

Mr. Pickersgill and The Gaslight and Coke Company's Bill.

NOTICE was given by Mr. Pickersgill that on the return of The Gaslight and Coke Company's Bill from Committee, he would move that a new clause should be inserted, in terms to be found in our "Parliamentary Intelligence." Briefly stated, the proposal is to load the Bill, by a vote of the House itself, with the restrictions upon the stock conversions suggested in Committee by the London County Council. The conversions of stock are not to take effect, according to Mr. Pickersgill's clause, unless and until the Company's selling price shall have been reduced to 2s. 6d. per 1000 cubic feet. Having got down to this fancy figure, the Company are not to be permitted to increase it unless by order of the Board of Trade. This order is not to be made until an inquiry has been held, at which the reasonable necessity of such increase shall have been established. Mr. Pickersgill's motion was to have come on yesterday, so that we write without knowing how the House took it.* It is not to be conceived, however, that Parliament would listen to any such outrageous proposal to interfere with the course of the Bill. It is unnecessary to show that this suggestion would not merely defeat the object of the sliding-scale, but would also bring back that unsatisfactory way of dealing with the price of gas in London which the sliding-scale was devised to supersede. Mr. Pickersgill, in short, is so Progressive that he would put back the clock of London gas regulation by at least a quarter of a century. He apparently forgets that, of all the

* We since learn that the motion was, by arrangement, postponed till the 9th prox.

vexatious and unsatisfactory ways of supervising the work of a statutory gas undertaking, as abundantly proved by home and foreign experience, that of holding an official inquest to determine the price at which the supply should be sold is the worst. It is practically impossible that an outside tribunal should be competent to teach a trader how he is to carry on his business; yet this is precisely what the method of regulation that seems to commend itself to Mr. Pickersgill implies.

The Parliamentary Work of the Week—Thanet and Southampton.

THE parliamentary proceedings of the past week in regard to gas were marked by an unpleasant surprise. The Thanet Company's Bill, having successfully passed through the Commons, came on Monday before a Lords Committee of which Lord Herries was Chairman. Opposition on the part of the Margate Corporation was persisted in upon the same lines that had failed to have effect in the First Chamber—the alleged danger to the Corporation water supply from the gas-works which it was proposed to construct on the site named in the Bill. The promoters had endeavoured to meet any reasonable, or even sentimental, objection that might be entertained by the Corporation to the erection of their new works upon the scheduled site. They accepted a clause requiring the construction of such works to be in accordance with plans approved by, and subject to the inspection of the Corporation's own Engineer. Upon learning, however, that the further progress of their Bill would be opposed, notwithstanding the insertion of this provision, the Company wrote to the Corporation, offering, upon terms, to substitute any other suitable site that could be found. The need for new gas-works is urgent, if the undertaking is to be carried on; and the proposed site is the only suitable one near the railway that can be obtained and conveniently used for the purpose. A strong body of expert witnesses testified to these facts, and denied the liability to pollution of the water supply from gas-works constructed, as these would be, with special regard to this contingency. It could not be denied, on the other hand, that the promoters had chosen for the site of their proposed works a plot of land immediately adjoining the water-works, if not absolutely over the collecting adits of the Corporation. The soil is chalk, in which the phenomenon of percolation of the surface water from considerable distances to uncertain depths is not unknown. The question for the Committee to determine was mainly whether it was expedient that gas-works should be constructed upon the site scheduled; and, in their wisdom, they decided against the preamble of the Bill. The result was staggering to the promoters, who pressed the Chairman for an indication of what the Company might sacrifice to save the rest of the Bill; but the Committee were obdurate. There is a chance that the Bill may be recommitted; but it is only a slight one. The rock upon which the Bill evidently split is a matter that requires a deal more consideration from gas managers than it has usually received. We shall probably return to it on a future opportunity.

The Southampton Gas Bill was in Committee on the 13th inst., opposed by the District Council of Eastleigh, who did not think the district fairly treated in the matter of price. Local considerations governed the question entirely. The borough of Southampton has been enlarged during late years, and it was the intention of the Company to level down their selling prices to a uniform figure over all the extended area. From this benefit the outside district of Eastleigh were to have been excluded by the terms of the Bill, though it is not a distant neighbour, and the demand for gas has grown rapidly. The Committee listened to the prayer of Eastleigh, and cut down the maximum price to that prevailing within the borough. The alteration was accepted; and the Bill, as amended, was reported.

Affairs of the Birmingham Gas Department—Reduction in Price.

THE Birmingham Corporation Gas Committee have every reason to be satisfied with the past year's working of the undertaking. A summary of the annual report appeared in last week's "JOURNAL." The demand for gas in the district served by the Committee is increasing rapidly; and the Engineers—Mr. H. Hack and Mr. C. Hunt—have as much as they can do to keep their works abreast of the requirements of the expansive times. It is satisfactory to find that the Committee recognize the bearing of this growth of business upon the Works Superintendents, whose positions are to be improved. The Committee have also been busy over the arrangement of superannuation schemes for the officers and workmen, in connection with which they have converted all official benefits and emoluments—such as house-rent, free gas, and so forth—into an equivalent of salary. This is doubtless, in the circumstances, a measure of reform; but at the same time there is something to be said for the theory upon which the old arrangement of free housing was based—that when a man was required to occupy a house upon or adjoining the works, he could not fairly be called upon to pay for it. A man who pays house-rent is apt to think he might be allowed to select his own house. Moreover, the interest of his successor may suffer. In the case in point, perhaps, the question is not of much practical importance. It is interesting to note how the Committee have dealt with the demand of the Home Office for information respecting the use of carburetted water gas. The report shows that the Committee have forwarded to the Home Office a statement explaining fully the reasons why they have adopted auxiliary water-gas plant, and the conditions under which it is used. Testimony is given as to the "invaluable aid which it has been to the resources "of the Corporation;" and the suggestion is offered that the Corporation should be trusted to manage this part of their business without interference by a central authority. The point is well taken; but it is difficult to see why Gas Companies should not be trusted in this regard as fully as Corporations. Whoever supplies illuminating gas to the composition of which exception might conceivably be taken in the interest of public security, does so at his peril. It cannot make any difference, if wrong is done, whether the culprits are a Municipality or a Company; while if there is no wrong, of course there is no injury.

The appropriation of the net profits of the department is set out in the report. The circumstances of the undertaking are such that the Committee feel they are not doing their full duty by Birmingham in handing over £30,000 a year to the City Improvement Committee, and defraying part of the cost of the public lighting. They have made up their minds that it is high time the consumers had something. Seeing that the price of gas in Birmingham was last reduced in 1884, it may fairly be argued that this example of the municipalization of gas supply goes to show that the consumers are the last to benefit from Corporation administration. The Birmingham Gas Committee have now nerved themselves to offer a reduction of prices which will nominally cost the undertaking £30,000 a year. In asking the City Council to endorse this suggestion, Alderman Pollack stated that the old scale dates from 1886. There was a temporary rise of prices in 1893-94, owing to the coal strike—for which, therefore, the consumers, not the ratepayers, had to pay. Alderman Pollack's speech upon this question, which will be found reported in another column, is well worth reading. It is a good display of those practical reasons of action which must instigate all gas administrations, whether municipal or otherwise. We are far from admiring all that the Birmingham Corporation do with their magnificent gas property; but it is impossible not to perceive that Alderman Pollack has a grip of the business of gas supply which few of the common sort of Gas Company directors exhibit. And as the Chairman is, so appear to be the majority of the Gas Committee. It is rather a bold thing to make a serious reduction of gas prices with residuals in their present commercial situation. But matters can hardly be worse in this respect; and Birmingham wants cheap gas as badly as it needs anything.

The Cost of Workmen's Compensation Insurance.

THE eminently sensible letter of Mr. Thomas Bower, on the subject of "Workmen's Compensation Insurance," which appears in our "Correspondence" columns to-day seems to carry the case originally stated by the writer to the North of England Gas Managers about as far as it will go for the time being. Mr. Bower is at one with most of his professional brethren in disclaiming any feeling of antagonism to Insurance Companies; but he believes—and, we think, justly—that, in making the rate for insuring gas workers, the associated Companies have misunderstood the degree of risk attendant upon this employment. Gas managers in general will be only too glad to insure their men under the new law, as they did under the old one; but, of course, it is possible to buy even complete protection too dearly. The trouble of self-insurance is, after all, not very great; and this will be the way in which the Act

will be worked until the Insurance Companies come to see that the life of a gas-works hand is not a hazardous one. Unquestionably, as Mr. Bower observes, the life is far less dangerous than that of either the shipbuilder or marine engineer. Mr. Bower's own experience goes to show how comparatively free from accident is the work of gas making in Hartlepool. But he admits that he has not had a fatal accident—nor even, it may be presumed, a case of permanent disablement needing a life-long provision. Here is the weak spot. If there had been but one such case at Hartlepool in the course of the record period, Mr. Bower's 2s. per cent. would not have sufficed to pay the damage. He may—*absit omen!*—have such a deplorable experience at any time. According to one view of the doctrine of averages, the very fact of his having escaped for so long only brings a compensating occurrence nearer. We have not much hope of, or faith in, the mutual assurance of gas undertakings for the purposes of the Act. If such an arrangement were carried out, and one of the contributory undertakings had a bad accident, there would be much unpleasantness if it were to appear that bad management or imperfect apparatus had contributed to the disaster. The indirect operation of the Act, in smartening up works management along the line of security for the workers, will probably be as marked as its direct results. One of the objects—it may be said the principal object—sought by means of the Act was the prevention of accidents. It seems to have been pretty well understood that in most employments, to say nothing about gas manufacture or distribution, there was something to be done in this way, that in all probability would be done when the employer found he would have to pay for remissness in this respect. It is not for us to say how far this consideration applies to gas-works; but we should just like to ask Mr. Bower whether he would be willing to insure all the workmen in all the gas-works he has seen, even in his own neighbourhood, at his own West Hartlepool rate.

Ornamental Directors.

In the course of recent proceedings of the House of Lords Committee on the Companies Bill, a remarkable passage occurred. Mr. John Smith, C.B., Inspector-General in Bankruptcy under the Bankruptcy Act, and also Inspector-General under the Board of Trade for the winding up of insolvent companies, gave valuable evidence respecting the working of the actual law and the probable effect of the alterations now proposed by the Board of Trade. One practical point touched upon by the witness was with regard to application money. He suggested that if the minimum subscription fixed by the Articles of Association had not been subscribed after the expiration of twenty-eight days from the first issue of the prospectus, all money received from applicants for shares should be forthwith repaid. He proposed that application-money should be repayable to the applicants on demand, without interest, and that if not repaid within ten days the Directors should be liable to repay the money with interest at the rate of 10 per cent. Passing to the debatable question of qualification and responsibility of directors, Mr. Smith astonished the Committee (the Lord Chancellor being in the chair) by declaring that "he saw no objection to ornamental "directors, provided they were put forward as such." The Lord Chancellor objected that one could hardly have these gentlemen described as "ornamental" directors in an Act of Parliament; but the witness then stated that he wished to direct the attention of the Committee to the practice which at present prevails in Scotland, where the directors are sometimes divided into the two classes of extraordinary and ordinary. The former is simply a patron of the company, without any definite duties beyond that of lending the credit of his name to the concern. In answer to a question, the witness said he believed that this class of directors are paid a fee; and he persisted in declaring that the arrangement works well. The Lord Chancellor demurred to this, and the following exchange of opinions passed. The Lord Chancellor: "I do not see in what "way it adds to the respectability, certainly not to the "stability, of a company, that it has got directors who "do nothing, who can do nothing, and are responsible for "nothing?" Answer: "Their social and public position "is an advantage to the company." The Lord Chancellor: "Perhaps this may do no harm in Scotland, because of the "extreme astuteness of the Scottish people. I think your "phrase 'ornamental director' a very apt one." Lord James: "Ornamental and not useful." The imagination boggles over the thought of what might happen if this classification of directors were carried into effect. How many gas directors could be advertised with the initials "O. D." appended to their names? Despite the incredulity of the Lord Chancellor, the idea of Mr. Smith is more often acted upon in practice than appears upon the surface; but, for all that, we conceive the world is hardly ripe for the candid revelation of the fact in prospectuses or on the back of directorial reports.

WATER AND SANITARY AFFAIRS.

The evidence given before the Royal Commission on the London Water Supply last week, by M. Gaston Cadoux, an official of eminence in connection with the Municipality of Paris, adds little to our knowledge of what system of water supply is best for London. This witness showed that since the buying up of the Paris Water Company by the Municipal Council in 1860, the charges had been considerably reduced. But it appears that this will involve a loss to the Authorities of a million-and-a-half of francs per annum for the next dozen years. The terms and conditions of the transaction, as between the Company, the Municipal Council, and the State, are themselves so peculiar as to furnish no example or guidance for our own Metropolis. In respect to the water itself, the Municipality was obviously compelled to seek some fresh source of supply, seeing that in times of drought recourse was had to Seine water "not always filtered." No such element of danger besets the Metropolitan supply, or is at all likely to do so. M. Gaston Cadoux ventured to tell the Commission that filtration was neither economical nor efficacious, and that the results obtained were not proportionate to the expenditure involved. We apprehend that this French gentleman can learn something with respect to water filtration, if he will put himself in communication with Sir Edward Frankland, Sir William Crookes, or Professor Dewar, together with other authorities upon the subject. But there is even Continental experience as to the bacteriological advantages to be secured by filtration properly exercised, though a French official may not perhaps care to be enlightened by Germany, to which source of information he was referred by Major-General Scott.

At the close of the evidence from the French witness, Sir Alexander Binnie was recalled, and put in a series of tables to show that the discharge of "effluent sewage" at Barking and Crossness would by-and-bye be about doubled—rising to 400 million gallons per day, or more than the upland water would suffice to carry seaward in seasons of drought. "Disastrous results" were predicted as the result of this dilemma, when it came to pass. We fancy Sir A. Binnie, in looking into the future, is not making due allowance for the circumstance that an increasing portion of the Metropolitan Water Supply which carries down the sewage has nothing to do with the Barking and Crossness outfalls. But even if all the 400 million gallons which are to constitute the London Water Supply in 1931, or soon after, should travel down to the Metropolitan outfalls, it has to be remembered that the "effluent" is a totally different article from the sewage, and is being refined to an extent which altogether disarms it as an element of disaster when poured into a stream such as the Thames at Barking.

At the half-yearly general meeting of the West Middlesex Water Company last week, Mr. E. Boulnois, M.P., the Chairman, remarked that up to the date of the Directors' report the Royal Commission on the Water Supply of London had held twenty sittings for the reception of evidence, and he expected that the Commission would have to hold another twenty sittings before they had completed their inquiry. But a thorough investigation of the subject is not a matter to which the Water Companies can make objection; and Mr. Boulnois has very properly adverted to the very ungracious attack made upon the Commission by the Progressive party in the County Council, as represented by Mr. Dickinson, the Chairman of the Water Committee, who thought fit to declare, at a meeting of the Council, that "the Commission was absolutely useless." We commented on this unseemly incident at the time, and we may further observe that, as Mr. Dickinson had previously been a witness before the Royal Commission on

three occasions, his opinion that the inquiry was useless says little for the character of his own evidence. In fact, that evidence appeared to us to be singularly weak; and it will be remembered that Mr. Dickinson caused some amusement by his withdrawal at one meeting of a certain memorandum which he had put before the Commissioners at the sitting a week before—his explanation being that his calculations were "not very serious ones," and he did not expect to be cross-examined upon them. Mr. Boulnois, in his address, accounted for the "strong words" used by Mr. Dickinson by the circumstance that the proceedings before the Royal Commission were not going quite so well for the County Council as that body had expected. An inquiry was now dealing with facts and figures which had not before been made the subject of investigation. It is this which constitutes the peculiar merit of the Commission, as we pointed out when the sphere of its inquiry was first defined. As for the pecuniary effect on the ratepayer, supposing the Companies to be superseded, it is perfectly clear, as shown by Mr. Boulnois, that the West Middlesex consumers would be the worse for the change, by losing their present rebate of 10 per cent.

Some other features in Mr. Boulnois' address call for notice. The whole of the Company's district within the Metropolitan area is now under the constant system of supply; and there is the prospect that the system will have to be extended to part, if not the whole, of their outer area. This is a change which it was thought at one time the Companies would never be able to effect, but which is nevertheless spreading very rapidly through the several districts, especially in the Metropolitan area. The last annual return by Major-General Scott showed that 86 per cent. of the houses receiving water from the Companies were supplied on the constant system. But the percentage in the Metropolitan area would necessarily be larger; and the ratio is continually rising. With strict supervision, there is economy in the constant supply; but outside this consideration, Mr. Boulnois is able to speak of the great extension of the Company's works, both in regard to storage and filtration, so that, notwithstanding the long drought, they would be able to command a sufficient quantity for the requirements of the district. As Chairman of the Staines Reservoirs Joint Committee, Mr. Boulnois was naturally called upon to refer to the two magnificent reservoirs in connection with that undertaking of which he lately cut the first sod, as narrated in our columns. The provision thus being made for the water supply of the Metropolis would seem to set at rest any question as to the necessity of seeking a fresh and distant source. Proper engineering and adequate filtration are securing a supply for the Metropolis abundant in quantity, excellent in quality, and such as will soon be universally constant. Working on these lines, we see a Company, in the case of the West Middlesex, earning the maximum dividend, and giving their customers a rebate of 10 per cent. This is better for the consumer than a rise of 30 per cent. in the rate of charge, which even Mr. Dickinson thinks possible should the water supply become the property of the County Council.

It would appear, by a report to be laid before the County Council to-day by the Water Committee, that Mr. Dickinson and his allies "cannot help believing" that the Royal Commission "will see the necessity of reporting before the "autumn." Otherwise the Government will not be in a position to give the notices required for legislation in 1899. Unless the Commissioners make haste, they will also place the Council in a difficulty, as the Committee do not think it would be expedient for the Council, except in the very last resort, to formulate their own proposals for legislative action until the Commission shall have reported. Under the circumstances of the case, it is considered possible that the Council may be in possession of the report of the Commission before having to decide on its own course of action. This clearly means that, if the report should happen to run counter to Progressive lines, the Council will have a plan of its own. The Water Committee are evidently ready with something, for they say, having reference to the expected issue of the Commissioners' report, "We therefore abstain from presenting "our recommendations for the present." But they want to see the Council in a position to take action, so as not to lose another year. To clear the way, it is proposed by them that certain Standing Orders of the Council shall be suspended, so that the Water Committee may be able to recommend application to Parliament on the subject of the water supply at any time not later than Nov. 15. The Progressives are in hot haste; and they fancy the Government are in the same humour. They reckon with certainty there must be either purchase or control, and most likely the former. A year lost tells against the enactments which provide that, if an undertaking is bought within a certain period, no additional value shall be allowed for any recent outlay. The lapse of time threatens to extinguish these concessions. A provision of this kind in one of the Acts of the Southwark and Vauxhall Company has already become obsolete; and others may follow. The County Council gave the Water Companies a short time to live; but threatened lives last long—a consolation of which the Council itself stands in some need.

ESSAYS, COMMENTARIES, AND REVIEWS.

GAS AND WATER COMPANIES IN THE STOCK MARKET.

(For Stock and Share List, see p. 1213.)

THE Stock Exchange at its opening last week was still strongly dominated by the impression produced by Mr. Chamberlain's speech. Almost everything was emphatically flat; and sellers offered freely. In addition to this, most people thought money was likely to be much tighter. But by-and-bye a change set in. Later political utterances were regarded as reassuring; and the anticipated demand for gold came to nothing. This put a better complexion on things; and markets went along more gaily. Consols profited largely by the cheapness of money; but the fall in prices was not recovered all through the list, and some departments closed worse than they had opened. The Money Market was much relieved by the light demand from America, and by the release of the Japanese pile. But, although money is very easy just now, things move so quickly nowadays that a change may come at any moment. Business in Gas must again be set down as only moderate; and there was nothing like real activity all through the week. Movements in price were quite irregular. On the whole, there were rather more retrograde movements than advances; but the latter were in connection with the more important issues. In Gaslights, the "A" had another good week in jubilation over its Bill, and gained five points—opening at 291, and closing with a mark of 296½, the best of the week. Dealings in the secured issues showed they were not inclined to be strong; and the 6 per cent. debenture had a fall. South Metropolitan was in good demand at advanced figures, and changed hands more than once at 137¼ towards the close. The debenture, however, was lowered a point. Commercials were quiet and unchanged. Suburban and Provincial Companies were quite stagnant; and there was hardly a single transaction in them. The Continental Companies were only moderately dealt in; and they showed some weakness—both Imperial and Union suffering a fall. Among the minor issues, a few changes for the worse took place—Malta, Monte Video, and River Plate being the losers. Business in the Water Companies was of the quietest description; and the only feature was a substantial reduction in the prices of the preference stocks. No change, however, was made in the ordinary stocks.

The daily operations were: Business in Gas was almost a blank on the opening day; only three or four bargains being marked. Gaslight "A" advanced 3; but Imperial Continental receded 2. Tuesday's transactions were brisker; and prices of all leading issues were good for the most part. But Imperial Continental and River Plate debenture fell 1. The tendency was favourable on Wednesday, though the volume of business done remained limited. Gaslight "A" rose 2; and South Metropolitan, 1; but Malta fell ¼. Thursday was firm and steady; and quotations did not make any move. The aggregate of business on Friday was small; and movements were irregular. South Metropolitan gained 1; but Continental Union fell 5; Gaslight 6 per cent. debenture, 2; and Monte Video, ½. In Water, both Chelsea preferences dropped 6; and Southwark preference, 4. Saturday was more than usually active; and prices mostly were good. But South Metropolitan debenture lost 1; and East London 3 per cent. debenture, 1.

ELECTRIC LIGHTING MEMORANDA.

The Report of the Chairman of the St. Pancras Vestry Electricity and Public Lighting Department—The Question of Depreciation—The Interests of Ratepayers and Consumers.

THE report of the Chairman of the Electricity and Public Lighting Department of the St. Pancras Vestry upon the work of the department for the municipal year ending last Lady-day, was briefly mentioned in this column last week. The principal figures contained in the report were also given in our "Electric Lighting Notes." In view of the importance of the St. Pancras undertaking as an example of the municipalization of electricity

supply in a Metropolitan parish, it is desirable to examine this report with some particularity. It is, as we have several times noted of late, a point of modern Progressivism in municipal politics that the electricity supply of a district should be in the hands of the local authority. This has been adopted as a settled principle of "Reformed" municipal politics, which except all "Reform Party" candidates accept unreservedly, and blindly act upon, the Progressive faith cannot preserve them from being classed among reactionaries, pro-monopolists, and traitors. The municipalization of electricity supply is not, however, a dogma which everybody is prepared to adopt without inquiry into the actual working of examples. If one is not to be precluded altogether from looking into the merits of the question, then these merits may be investigated, with reference to any example, either with respect to the interest of the ratepayers as owners of the undertaking, or as users of the supply. Let the St. Pancras report speak for both. The able Chairman of the Department, Mr. H. J. Menzies, shows that for the whole six years' working, there has been a gross profit of £45,535. Of this amount £27,332 has had to be paid for interest; and £10,931 for repayment of capital. Thus a balance of £7271 is left, to be appropriated as follows: Written off preliminary expenses, £554; contribution to lighting-rate in lieu of further reduction of price, £1000; reserve fund, £4000; carried forward to the 1898 account, £1717. How do these appropriations meet the necessities of the case? There is actually a capital expenditure of £210,680; and the account is far from being closed—a further expenditure of £45,000 being already ordered. The interest and repayment charges must increase in amount, though, if the business continues to grow, the burden of capital per unit sold will of course decrease. How is the depreciation to be provided for? We have sought for it, but this pregnant word is not once mentioned in Mr. Menzies' report. Yet it is obvious to all but those who will not see, that the depreciation on a capital of upwards of a quarter of a million, much of it being sunk in perishable plant and machinery greatly liable to wear and tear, should be considerable, even if the expenditure had been made with the utmost prudence and justified foresight in every respect.

This latter consideration has not been realized in the St. Pancras installation. Mr. Menzies remarks that in the revised original estimates, on which the Vestry went into the business, "the price per unit was fixed at 2·45d. works cost, and 0·75d. for interest and repayment charges." The text of these estimates will be found in the number of the "JOURNAL" for Jan. 28, 1890 (p. 157). It will be seen from it that the estimate of works cost referred to by Mr. Menzies included an allowance of £3400 a year for depreciation—and this on an output of 825,000 units per annum, which corresponds fairly enough with the business done by the undertaking in 1895. The volume of business now attained is greatly in excess of what was contemplated in the original estimates; but the modest provision reckoned upon in them to keep up the establishment has not been reached. Approximately, Professor Robinson's estimate of the cost of depreciation was 1d. per unit produced. Not a single penny has been laid by on this account; and since the works started 5,321,466 units have been charged to consumers. If there had been no unaccounted-for electricity, therefore, the undertaking is behindhand by £22,172 in respect of the penny rate for depreciation. Corrected for the output, the gap is widened to nearly £30,000—and the liability is a continuous and increasing one. The small "surplus" profit claimed in the report would not go far to fill this gaping void between solvency and its opposite.

There is more, however. Mr. Menzies pleads that Professor Robinson's original estimated works cost of 2¾d. per unit "might have been realized but for our heavy repairs." But why such heavy renewals and repairs to be defrayed out of revenue during the first youth of the undertaking? The explanation is, "early faults," which "it is to be hoped" are "now removed." Early faults are naturally inseparable from new ventures; and St. Pancras has had to buy its experience, from which later concerns of the same kind can learn. Still saying nothing about depreciation, which is properly a works charge, Mr. Menzies gives up the original estimate of the capital charge—0·75d. per unit—as being "altogether too low." Yet he is hopeful that when matters have worked into ship-shape order, and the full benefits of the 220-volt system of supply are obtained, "the original figure may not be far exceeded"—always leaving out the depreciation. Meanwhile, "the additions sanctioned by the Vestry will charge the lighting rate by at least £9000 per annum." It is elsewhere claimed that for the immediate future the St. Pancras price per unit will be "the cheapest in London;" but inasmuch as this reduction is only rendered possible by the subsidy taken from the rates, the conclusion seems unavoidable that the interest of the ratepayers is not directly served by this conspicuous example of the municipalization of electricity supply. So far as the consumers are concerned, they have not much to rejoice over. With all their sacrifices, the Vestry cannot reduce their price per unit sensibly below that of the Metropolitan Electric Lighting Companies. Municipalism is scarcely justified by results even in Mr. Menzies' report, when the cost of making the unit last year was greater at St. Pancras than in the case of all the other Metropolitan undertakings (companies) cited. To pay more for manufacturing and charge less for the product may be Progressivism, but it most certainly is not business.

NEW LIGHTS ON THE LABOUR QUESTION.

THE two most important Reviews—the "Quarterly" and the "Edinburgh"—have each in the current number a prominent article on the Labour Question. This is as it should be; for after so profound a disturbance of the industrial world as the strike in the engineering trade, it is fitting that such powerful moulders of public opinion as these publications should undertake the task of defining the position. One Review is a voice of the party of "Law and Order" in the State; the other is steeped in the tradition of Whiggery. It is therefore not a little interesting to note how the same state of affairs appears to observers occupying such different standpoints.

Curiously enough, both writers commence with the very same topic—the decision of the House of Lords in the case of *Allen v. Flood*. The "Quarterly" gives a good summary of the facts; recording the judgment that the Trade Union official Allen had not committed an actionable wrong in procuring the dismissal of the plaintiffs from their journeymen's employment. The reviewer's comment is that "the incident only brings into relief the well-known fact that many acts, perfectly legal in themselves, may yet be used for purposes most tyrannical and unjust." And the conclusion is drawn that "this important decision, though in form a great victory for militant Trade Unionism, will, by the employers, be regarded as an additional argument for extending the principle of Federation which has proved so irresistible in the engineering dispute." The comment of the "Edinburgh Review" is that this was "a case in which one undoubted right came into collision with another. An employer is clearly entitled to employ any workman, and a workman to serve any employer. On the other hand, workmen, so long as they break the terms of no contract, are entitled to refuse to work for any reason which seems good to them, even if it is to obtain the discharge of an obnoxious fellow-workman. . . . . The law, after having for some time shown a disposition to award damages to workmen deprived of livelihood by their fellows, henceforth disinterests itself in these matters." With all deference, we venture to think that neither of these critics properly takes the point upon which the decision under notice really turned. This was nothing more nor less than the question whether an action will lie against C for inducing B to perform a perfectly legal act, whereby A is, or considers himself to be, injured. Can A, in such circumstances, sue C? The answer of the House of Lords is in the negative. The decision is not more of a victory for Trade Unionism than it is for any other agency whereby legal rights can be applied oppressively as regards the individual.

Both reviewers next proceed to discuss the engineers' strike. The "Quarterly" traces the origin of the trouble to the fact of the A.S.E. having been captured by a Socialist executive, which directed the tactics of the Union "to the attainment of an ideal, which, in the opinion of nine men out of ten, is absolutely impracticable. It involves, in fact, a complete destruction of the capitalist system in general, and of the English engineering trade as its first and particular victim." The reviewer gives instances of the regulations of the Union which the employers had reason for regarding as incompatible with the existing conditions of industry. It is noted that the inevitable trial of strength between the Union and the employers took place on the question of the 48-hour week for London; this particular claim being chosen to fight upon, for technical reasons. "The ultimate and avowed aim of the Union officials is the supersession of the capitalist by Collectivism. All aggressive action, therefore, is justifiable; and it is probably waste of time to look for any other reason than that the juncture seemed to the officials a favourable one for striking a blow at an institution which they wish to extirpate without remorse." Upon their chosen ground, however, and under their own leaders, the men were beaten; but at enormous cost all round. "Even more deplorable, in our opinion, than the material loss involved in such interruptions of trade, is the fruitless expenditure of ingenuity and passion and self-sacrifice, which, directed to more practicable ideals, might add so largely to the happiness and comfort of the labouring class."

The other reviewer remarks that the dispute "ended, as public opinion seemed to demand, not in the annihilation of the Trade Union, but in its defeat on the chief points at issue. . . . It will be found that the conflict has been worth its cost. It has cleared the air of vexatious outstanding questions, and has taught the engineers to know better the limits to which their action can at present be wisely and successfully extended." This writer thinks that in industry "the age of skilled diplomacy is succeeding to that of war." But with one big strike just ended, and another in full swing in South Wales, this remark appears to be open to the objection that it takes the wish for the fact. This weakness is the traditional one of the writer's party. Again, the reviewer ventures to anticipate that fifty years hence it may be seen more clearly than now that the sound instinct of Englishmen for their needs and destinies "has in this century led the great industries through a long period of conflict to higher peace and unity. It may be found, in the twentieth century, that, earlier than those in any other country, the English trades (we include in this term employers as well as employed) have hammered out superior forms of organization which will enable them, at peace within themselves, to defeat in the world's markets rivals

who now, perhaps, benefit in some degree by our domestic dissensions." Let us hope so, albeit lawlessness and the entertainment of impracticable ideals—the characteristics of militant Trade Unionism—do not appear particularly English instincts.

The next question is, naturally: What had better be done now? How "reconcile order with energy" as the "Edinburgh" reviewer states the problem. To what extent should the State intervene in the settlement of industrial questions? This brings both reviewers to the consideration of Mr. and Mrs. Sidney Webb's apology for Trade Unionism, in the book called "Industrial Democracy." The criticism of this work is carried to some length in both articles. Upon some of the authors' points the critics characteristically differ. Granting that the main reason for the existence of Trade Unionism consists in its substitution of "collective bargaining," in the presumed interest of the workmen, for the individual contract of service, they are strikingly agreed in disputing the value of this substitution. The "Quarterly" writer remarks: "This process of collective bargaining seems to us not to be a bargain or a contract at all, but an attempt to bring back the labourer to a condition of *status* from which the progress of civilization has partly emancipated him. It may be true that philanthropy and not feudalism now regulates the status of the national minimum; but in our view the distribution of labour by means of free contract has been in the past, and will be in the future, the labourer's best charter of advancement." Hence the conclusion drawn is that "the ideal to which we must slowly work is complete liberty given to the employers' ability for the expansion of industry, and complete liberty for the individual units of labour to follow those trades which offer the best remuneration." So also the "Edinburgh" critic thinks, though he gets at it by a different line of argument. Collective bargaining on the part of the workpeople cannot go very far in any trade without encountering resistance in its own kind, through the federation of employers. For by far the greatest number of workpeople it cannot be made to apply at all. "Unskilled and agricultural labourers, women, and the wandering race of seamen never have succeeded, and probably never will succeed, in establishing really strong and lasting organizations. Bounds are set, by the nature of things, to the extension of permanent Trade Unionism, and not more than about one-sixth of the industrial male adult population of the United Kingdom belongs to these societies. Therefore, important as collective bargaining is, and great as are, no doubt, its indirect as well as its direct results, its power of raising and protecting the standard of life is confined within certain limits." This is a consideration which "popular" politicians, liable to be impressed by Trade Union clamour, will do well to bear in mind. It must not be forgotten also that whatever good purpose Trade Unions can claim to serve is confined to their own members. The "Edinburgh" reviewer carries his indictment of Trade Unionism to other issues. He denies that Trade Unions had anything to do with the educational protection given to children. Nor had they much more of a hand in factory and workshop legislation. It is the community itself which "has become more sensitive to suffering and inequality, has taken steps to inform and enlighten itself, and has gradually acted upon the information gradually obtained." If the Legislature had waited for the Trade Unions to point out how the condition of the working classes could be ameliorated, not much would have been done in this line. Bands and banners, and the glorification of officials, are more in fashion with the Trade Unions.

The fault of Mr. and Mrs. Webb, as of so many authors of the day who, not being industrials themselves, plunge into "Labour" politics, is making altogether too much of Trade Unions and Trade Unionism. They also set too great a store by legislation and Government regulations for the benefit of working people; forgetting the inevitable mistakes and shortcomings of administration as contrasted with the best-intentioned law-making. Law is met with evasion all the world over. If this is so in regard to those subjects of legislation which are by common consent given over to the domination of the law and its "limbs," what might be expected if the realm of law were to be artifically extended to include commercial and labour bargains? "The gradual establishment of a complete Labour Code, supplemented by public Courts of Arbitration, might in time supersede, as Mr. and Mrs. Webb anticipate, the present militant action of Trade Unions. But then, on how colossal a scale should we have the perpetual discontent, grumbling about classification, jealousy and political machination, which, among those employed in Government service, is an unhealthy substitute for the sharp labour conflicts and intervening good humour in the world of open industry." Truly, the "Edinburgh" is even more discouraging to the Trade Unionist ideal than the "Quarterly." Both hold up the ideal of solidarity between employers and employed as worthy of attainment; but whereas the "Edinburgh" critic almost advocates this being done "by hook or by crook," his rival contemns all "rings" that have no natural basis in the conditions of free industry.

In one respect the teaching of the "Edinburgh" reviewer is helpful to those who, while admitting that the high positions and good wages of the future will necessarily become the portion of the clever ones, still have a corner of pity for the "duffers," who cannot keep up with the procession. We all know what Trade Unionism wanted to do for them. It desired to restrict production and hobble ability in the interest of the great middle-class of mediocre workers, with a weakness for the rank "duffers" of the trade. This cannot be. Ability must have its way, for the sake of the race even more than of the individual. But this is no reason why the dullards should starve. The weak and the unskilled will find their lot improved, simply by reason of the diminution of their numbers. As the clever ones draw ahead, so those who are only good for the most primitive kinds of the world's work will become fewer, and their earnings will be raised. We can see this process already going on with agricultural labourers and domestic servants. The difference in the scale of remuneration between these occupations and those of so-called skilled workers, once considerable, tends to disappear. Then there is the effect of machines. "The age of machinery consolidates itself; and all causes tend towards greater equality in social conditions." The "Quarterly" writer has very similar observations—of course, with a difference. He agrees that the movement of labour towards the best-paid employments has had the effect of levelling-up matters all round. Ability is much; but it is not everything. The cleverest man can do little for himself if his cleverness is of a kind that his fellows do not want. It were better for himself, perhaps, to be a downright blockhead, so long as he can do something useful. Where, then, are the poor of the future to come from, if, as appears likely, the agricultural labourer and the domestic servant are to hold up their heads with the mechanic and the "accountant" who hails from the Board School? In the opinion of the "Quarterly" reviewer, "the poor man is the primitive man whose appetites still elude the discipline of civilization." That is, he is the man who cannot learn to put his earnings and resources to a good use. The reviewer commends "the system of share-owning which Mr. G. Livesey has arranged for the workmen of the South Metropolitan Gas Company," and thinks that "if it could be more widely extended, it might do something to direct to more profitable use that ill-spent surplus expenditure which Sir E. Chadwick detected in the economies of even the poorest." Again, the writer holds that "a fall of 25 or 50 per cent. in the cost of bicycles—a result against which the late engineering strike was a stubborn resistance—would make the bicycle a more formidable competitor with the public-house than the comparative remoteness of independence and property, and all they connote, has ever suffered them to be." From this it is to be gathered that the reviewer has laid hold of some bottom facts of contemporary life that do not take the attention of the ordinary preacher or would-be reformer of the manners of the English people.

THE USE OF GAS FOR PUBLIC LIGHTING.

In the course of the remarks with which Mr. Corbet Woodall introduced Professor Lewes at the Society of Arts on the occasion of the reading of his paper on "Water Gas," given in the "Journal" last week, he referred to the fact that he had not presided at a meeting of the Society since Mr. Sugg had at a rather critical period in the history of the gas industry given the members the benefit of his exceptional experience in the domain of outdoor illumination, by showing them, and through them the parties specially concerned, how they could improve the lighting of public thoroughfares. At that time, the Jablochkoff electric lamp had made its appearance; and, as Mr. Woodall remarked, there were many who predicted that gas lighting had reached its zenith, and that henceforward it would decline before the brilliancy of the younger luminary. Mr. Woodall's figures proved that this prediction has been falsified. The advent of the electric lamp put gas engineers on their mettle; and among the earliest to show what could be done in the way of street lighting, if the authorities were willing to pay for it, was Mr. Woodall, who, in a portion of the Waterloo Road, effectually demonstrated, as he stated at the Society of Arts, that, "in point of economy, efficiency, and picturesque effect, gas was still able to hold its own" for the lighting of public thoroughfares. Other experiments of the same kind followed—generally at the expense of the parties making them; and while the superiority of the light was readily acknowledged, the advisability of the permanent adoption of the improved system, at a necessarily enhanced cost, was a proposition which met with less prompt acceptance. However, Mr. Woodall's experiment has borne good fruit in the better lighting of our public thoroughfares.

It was in Paris that M. Jablochkoff demonstrated the practicability of lighting streets by electricity; and in that City of Light no less than here the gas engineers showed what they could do with their illuminant. The Paris Gas Company found an excellent field of operations in the Rue du Quatre Septembre—a fairly broad street running diagonally in a south-easterly direction from the open space in front of the Opera, as the Rue de la Paix does in a south-westerly one on the other side. It will probably be remembered that the Company's engineers designed a new lamp to which they gave the name of the street in which it was first used; and a very effective display they made with it. It may be said that in the two thoroughfares above named and the intervening Avenue de l'Opéra the "battle of the lights" has been fought during the past twenty years. At the present moment, the spot is an exceptionally favourable one for judging the effect of gas and electricity for outdoor illumination. Standing at the point from which the three streets start, those

to the right and left are perfectly resplendent with the warm and brilliant light afforded by the multiple-flame high-power lamps which are ranged on either side of the roadway; whereas the electric arc lamps in the avenue present to the eye a series of cold pale "moons" which are in very striking contrast to the glowing "suns" in their immediate vicinity. Gas certainly holds its own here.

Apart, however, from the ordinary methods of lighting public thoroughfares by gas, there is the incandescent system—the latest weapon put into the hands of the gas engineer wherewith to attack his opponents. Reference has already been made to Paris, and to that city we must go for one of the most striking displays of this system in existence. Many of our readers are doubtless aware that the Place de la Concorde and the Champs Elysées are now very effectively lighted by incandescent gas-burners enclosed in glass-rod chimneys. Berlin, Vienna, and other Continental cities, are well to the front with incandescent gas lighting; while on this side of the Channel, not only in London and its suburbs, but in a large number of provincial towns, Welsbach burners, singly or in clusters, are in use for street illumination.

Objections have been raised to the incandescent gas system on the ground that the constituent parts of the apparatus are too delicate for every-day use. But recent utterances by those who are competent to express an opinion on this question show that all that is required to ensure success is the exercise of care and attention. Of course, it would be absurd to say that finality has been reached—that the system has been brought to perfection. Mr. Jolliffe told the members of the Eastern Counties Gas Managers' Association a few weeks ago that his Assistant (Mr. Prentice) had experimented with a bunsen burner so perfect that it gave a light of 26 candles for each cubic foot of gas consumed; and quite recently gas managers had an opportunity of seeing at Niagara Hall the new burner of the Welsbach Company, by which from 25 to 30 candles per cubic foot is obtainable with an ordinary mantle used without any chimney. These burners, employed in conjunction with the new lantern designed by Mr. Sheldrake, which was shown at the hall, and was described and illustrated in the "JOURNAL" last week, should prove very valuable aids in the realization of effective and economical public lighting by gas. A desire was expressed at the time of the exhibition that gas managers in the country should be afforded an opportunity of seeing the new burner at work; and we are informed that arrangements have been made for having similar displays, under Mr. Sheldrake's supervision, in the principal provincial towns. The first of the series opened yesterday at Bristol, and will continue till to-morrow; and we are sure the result will be to demonstrate once more that gas is still able to hold its own for lighting public thoroughfares and large open spaces.

FATAL LIQUID ACETYLENE EXPLOSION AT JERSEY CITY.

A RECENT number of "Progressive Age" was almost wholly devoted to a report upon the circumstances attending the destruction by fire and explosion of the works of the United States Acetylene Gas Liquefying and Distributing Company, at Jersey City. This is the explosion recorded in the "JOURNAL" at the beginning of the year (*ante*, p. 44), when it was stated that fifteen men were killed out of 100 employees on the establishment. This was a gross exaggeration; there having been only two men killed—the Superintendent (Mr. Max Grimm) and a workman named White—while the "works" consisted of a light wooden shed containing the acetylene gas generators and compressors, and there were only half-a-dozen hands about the place. The story of the explosion is of a piece with the usual happy-go-lucky American manner of treating dangerous trade processes, until something happens and there is a burst of panic legislation—only to be evaded later. It appears that the people who undertook the preparation and sale of liquid acetylene at the works in Jersey City were previously engaged in making ammonia ice machines, and also did a trade in cylinders of carbonic acid gas. Consequently, the wooden sheds contained a stock of compression cylinders containing liquid acetylene, carbonic acid, and ammonia. The Company started making and compressing acetylene without notifying the town authorities of their proceedings. They did inform the insurance offices, with the result that, after a preliminary demonstration of the innocent character of liquefied acetylene at which the unfortunate Superintendent was severely burnt, the risk was declined. The operations went on, until it was usual to have about 700 lbs. weight of liquefied acetylene in stock. This would be kept in cylinders holding 10 or 20 lbs. Every pound weight of the fluid was calculated to yield 15 cubic feet of acetylene gas. These cylinders were sold for use in private lighting; and nobody seems to have entertained the smallest notion that the preparation or use of the fluid was more dangerous than that of Pintsch gas. This went on for a year.

The operation of preparing and compressing the acetylene was done carefully. Mr. Julius John Suckert, described as a chemist, and President of the Ice Machine Company, devised the process. There were so-called generators, strong steel cylinders, in which the calcium carbide was placed and wetted. Before the water was introduced, the pump was started to clear the system of air. Then, the first portions of gas that came over were expelled into the air outside the shed. Three strokes of the compressor were made to waste in this way. Then the gas, dried by passing over trays of carbide, was pumped into the storage cylinders, where it liquefied. Nothing could be simpler, or better ordered. If the carbide is reasonably pure, and the acetylene carefully prepared from it, there is no great risk in storing or using it from properly made cylinders. Those used at the Jersey City works were good, and provided with safety diaphragms, which would burst at 120 atmospheres and melt at 150° Fahr., when the gas would escape at the valve-orifice. But the question of safety in these matters arises, not when everything is right, but when something goes wrong. A day came when the man who was bottling off the acetylene at Jersey City found there was a stoppage in the pipes. The joints had to be broken in order to get at the obstruction; and a mixture of air and acetylene gas got into the system. The man White found that one of the cylinders did not contain liquid acetylene, as usual. As a matter of fact, it contained a mixture of the gas with air. He took it off to empty it; and by some means, which the Coroner's jury carefully missed finding out, the mixture was ignited and burnt at the valve-orifice. Then the workman lost his head. Instead of closing the valve of the cylinder, and so extinguishing the flame, the man ran for the Superintendent, who was in his office. The latter rushed for the cylinder; but before he could reach it, the pressure from within failed, the flame struck back, and the residue of the contents exploded. This seems to have started other explosions; and then the flimsy buildings caught fire, and an anhydrous ammonia cylinder "went off" with tremendous effect—fragments being found a quarter of a mile away. Yet of 60 full cylinders of the three gases—acetylene, carbonic acid, and ammonia—which passed through the fire, 48 did not actually burst; being saved by the rupture of the safety diaphragm. In all, 56 drums of calcium carbide were uninjured by the fire. Professor Morton, of the Stevens Institute of Technology, was called to testify to the essentially innocuous character of the process employed for preparing liquid acetylene. The whole proceedings before the Coroner's jury, however, do not inspire a reader with respect for the manner in which the inquiry was conducted. Notwithstanding the cheery optimism of Mr. Suckert and Professor Morton, the Coroner's jury promptly found that "business of such a nature should be conducted remote from human habitations." They also condemned the head of the Fire Department of Jersey City for allowing the trade to be carried on. Here the miserable political consideration comes into prominence; "Progressive Age" declaring that the condemned official "was of a different political complexion, and made a good target." The cause of public security seems in a bad way, where questions of life and death are treated as points in the sordid game of ward politics. At any rate, the Jersey City authorities got a bad scare over this explosion, as well they might; and lighting by means of compressed acetylene seems to have gone out of fashion in this part of the world. There is no valid reason why it should ever have been used, except that the Company engaged in the business probably made a little money at it. Acetylene gas apparatus working at a low pressure will do as well as a high-pressure plant; and there have been enough fatalities and "scares" from the operation of the latter in different parts of the world, to warrant the suppression of the manufacture as a dangerous nuisance.

The Lecomte Low-Pressure Burner.—At the last meeting of the Société Technique du Gaz en France, M. Lecomte described his low-pressure burner, to which reference has already been made in the "JOURNAL." One of the burners had been sent to the Committee of the Society, and tested for them by M. Vautier; and upon his very favourable report, they awarded M. Lecomte a premium of 500 frs.

Determining Traces of Carbon Monoxide in Gases.—This subject has been dealt with by M. Nicloux in the "Comptes Rendus." The process consists in aspirating the gas through a series of U tubes, containing respectively solid caustic potash, sulphuric acid, pumice, and iodic acid. The last tube is immersed in an oil-bath kept at 150° C., and communicates in turn with an absorption-tube containing 5 c.c. of caustic soda solution of density 1·3 mixed with 5 c.c. of water. The first two tubes serve to remove any carbon dioxide, sulphur dioxide, or hydrogen sulphide, and to dry the gas. Any carbon monoxide is oxidized by the hot iodic acid, and the iodine vapours are retained by the caustic soda; the last traces being carried through the apparatus by the aspiration of 1 or 2 litres of air. The soda solution is acidified by sulphuric acid, and nitrous acid added to liberate the iodine, which is then dissolved by vigorous shaking with a known amount of carbon bisulphide, and estimated by comparing the tint of the solution with those of corresponding solutions made from known amounts of potassium iodide. The iodic acid tube must be sealed after filling, and blank experiments made with the apparatus beforehand, to ensure the absence of organic matters which might liberate iodine. Carbon monoxide forming from 1-10000th to 1-500000th of the volume of the gas to be analyzed can be thus determined, with a maximum error of 10 per cent.

PERSONAL.

Mr. JOHN ELY, the Secretary and Manager of the Abingdon Gas Company, has resigned this position, which he has held for a quarter of a century, owing to impaired health.

The Leeds Corporation Gas Department have appointed Mr. P. M'DOUGAL, of Middlesbrough, as Assistant-Manager of the Mains and Services Department. There were 60 applicants.

As the result of the pressure which has been put upon him by his many friends both inside and outside the Liverpool City Council, Sir ARTHUR FORWOOD has consented to withdraw his resignation, and to allow himself to be nominated for re-election as an Alderman. But at the same time, he intimates that, if re-elected, he will be compelled to relinquish some of the duties he has hitherto undertaken in municipal work.

Mr. THOMAS GOULDEN, Assoc.M.Inst.C.E., who has been long connected with the management of the Beckton works, is to have the appointment of Engineer of The Gaslight and Coke Company's principal station, but with more direct reference, we understand, to Horseferry Road—through Mr. Trewby—than was usual during the late Mr. Methven's time. Mr. Goulden was, it is said, offered an important appointment on the staff of another of the Metropolitan Gas Companies; and only declined the position on his succession at Beckton being assured.

OBITUARY.

The death is announced as having taken place on the 15th inst., in his 71st year, of Mr. JAMES CASTLE, the Secretary of the Ossett Gas Company. Deceased was very well known throughout the district, and was the oldest official of the Company. He became collector, in succession to the late Mr. G. Lodge, upwards of 30 years ago; and about 15 years later he succeeded the late Mr. Haigh, of Wakefield, as Secretary. He leaves a widow, one son, and three daughters, all married. The funeral took place last Wednesday; and, beside the deceased's immediate relatives and friends, it was attended by four Directors, the other officials, and some of the workmen of the Company.

We regret to record the sudden death on Monday last week, of Mr. WILLIAM SMITH, the Secretary and Manager of the Hyde Gas Company. He had not been in very good health for some time; but he had nevertheless been able to discharge his duties, and was in attendance at the gas-works on the Friday morning before he died. In the afternoon, however, he complained of illness; and medical aid was sought. A marked improvement was manifest on Sunday; but a sudden relapse ensued, and though the services of another doctor were obtained, they were unavailing. The patient gradually succumbed—death resulting from syncope. Deceased was in his 69th year, and had been in active work for about half-a-century. In 1862, Mr. Smith, who at that time was collector of rents for the late T. Mottram (in respect of a private water undertaking which has since been purchased by the Hyde Corporation), succeeded the late Mr. S. P. Leather as Manager of the Hyde Gas-Works, of which his uncle, who bore the same name, had been Secretary from the commencement. On the death of this gentleman, some twenty years since, Mr. Smith was appointed to the vacant office. He was one of the founders of the Manchester District Institution of Gas Engineers; and though he did not aspire to occupy the presidential chair, he did useful work as Auditor, and by his genial qualities and musical ability gained the confidence and esteem of his fellow members. He joined the British Association of Gas Managers in its earliest days—his membership dating from 1864; and he remained with it as The Gas Institute till his death. He filled the position of Auditor in 1889 and 1890. Mr. Smith was connected with the principal local institutions, and was also a Freemason. He found so many ways of rendering himself unobtrusively useful, that he will be greatly missed in Hyde. The funeral took place last Thursday, when the President (Mr. W. S. Haddock) and several members of the Manchester Institution joined the representatives of the Hyde Gas Company and of other bodies with which Mr. Smith was associated, in paying a final tribute to the memory of their late colleague and friend.

Inconveniences of Acetylene.—Herr Josef Vertess has been studying the use of acetylene on a large scale at the central station in Veszprim, in Hungary; and the results are given in the "Chemiker Zeitung." He says that acetylene ought to be purified in the same way as coal gas; and until this is done it cannot make much progress as an illuminating agent. The burning of unpurified acetylene in closed rooms is inimical to health; the most dangerous impurity being phosphoretted hydrogen. The author thinks there is no doubt that some of the so-called spontaneous explosions have been caused by the ignition of this gas at the temperature existing in the generator. The worst inconvenience of acetylene, however, is the smoking of the flame. The best burners are those with from 10 to 12 small flames, as each flame has a separate atmosphere; but even with these, smoking sets in after from 200 to 300 hours' burning. The cause is the decomposition of the acetylene through the heat of the burner. The carbon deposits in the narrow opening of the burner, and the flame begins to smoke.

NOTES.

An Experiment at High Temperature and Pressure.

The result of a curious experiment with high temperature and pressure is communicated to the "Chemical News" by Mr. H. N. Warren, of the Liverpool Research Laboratory. The apparatus employed in these investigations consisted of a small platinum tube 1-16th inch diameter and ¼ inch thick, enclosed in a casing-tube of cold-drawn steel, 12 inches in diameter, which formed a very strong jacket, and was closed by a cap screwed on by a special thread 3 inches deep. In one series of experiments with this formidably strong arrangement, 5 grains of cane sugar were put into the inner tube, and treated at a red heat for five hours. Upon the tube being opened after cooling, the contents were found to be a few drops of water, accompanied by a powerful odour of acetylene, and also an extremely hard and crystalline graphite, presenting when microscopically examined an appearance closely resembling the best cut retort carbon, with a brilliancy corresponding to that of crystalline silicon. The appliance is regarded as offering the possibility of revealing some important electrical and chemical facts; but the extremely dangerous nature of the experiments, necessitating as it does the greatest care in conducting them, to a great extent retards the investigation in those directions from which valuable results might be expected.

The Use of Coke Breeze for Town Buildings.

Speaking at the Surveyors' Institution on the subject of fireproof building construction, Mr. Arthur Harston remarked that the nearest approach to a fireproof building is one composed of materials which would retard the progress of a fire; and such a material is coke-breeze concrete, one of the chief advantages of which is its lightness. It could be used for floors, and boards could be nailed to it, thus avoiding air spaces. The cheapness of coke breeze is also a great recommendation. Moreover, coke-breeze concrete suffers less disintegration from sudden heating and cooling, due to local fires, than any other material of the class. In consequence of the continual traffic over roofs of town houses by electric light and telephone men, it is becoming increasingly important to have a more solid kind of roofing than slate—not only for the sake of fire protection, but also to maintain a waterproof covering. This want is supplied by light concrete, with a covering of asphalte. As to stairs, concrete is to be preferred; but it should be made of some harder material than coke breeze. In dealing with the ground floor of a building where coke breeze is used, an impermeable surface must be put either below or above the coke-breeze concrete, otherwise the ground-damp would get through and attack the boards nailed upon the coke breeze. Mr. Harston laid the greatest stress upon the general advantages of this material of building construction for town use.

The Cause of "Livery" Paint.

It is well known, observes Herr W. Lippert in a German chemical publication, that certain pigments employed for preservative painting, more especially zinc white, have the undesirable property of causing the paint of which they are a component to become so thick—or, technically, "livery"—as to prevent its being applied to the work with a brush. In the text-books, this mischief is said to be due to the combination of the metallic oxides with resin acids; but Lippert declares that, as a matter of fact, it is determined simply by the presence of any free acid in the vehicle, whether it be the fatty acid of an oil, or the acid of any resin. The intensity of the thickening, however, is not necessarily proportionate to the amount of oxide and the acidity of the oil or varnish; but it depends rather on the particular nature of the two substances taking part in the reaction. Indeed, drying oils and varnishes, even when they are fairly old, should contain but little free acid. The acids of a solid resin do not produce so marked a thickening effect in paint as the fatty acids of an oil; and even these are less active than the acids of some Australian copals. The new adulterant "tung oil" is very bad for this. Lippert also remarks that, in the majority of cases, paints which thicken on exposure to air form no skin, or only an imperfect one. Contrariwise, paints that skin over do not thicken. An experimental paint composed of commercial zinc white and "manganized" oil behaved well.

Professor Hele-Shaw on Water-Flow.

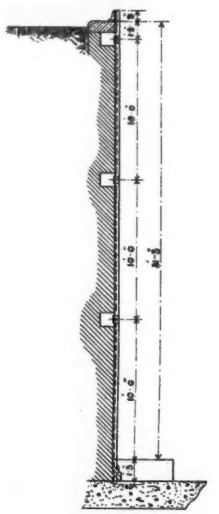
Vast theoretical, and much practical, importance attaches to the researches of Professor H. S. Hele-Shaw into the action of streams of water in contact with bounding or intercepting surfaces. As the result of previous investigations mentioned in these columns, it was found by Professor Hele-Shaw that the flow of water in two dimensions past obstacles of various forms could be studied by the use of water with which a quantity of air had been mixed. At the last meeting of the Institution of Naval Architects, Professor Hele-Shaw read a paper continuing the story of his researches. The text, with the extremely instructive illustrations of the experiments designed to show the forms in which surface resistance to the flow of water manifests itself, has been published in "Engineering." Some of these experiments deal with the motion of water in pipes and channels. The case of a flow through a gradually enlarged and then contracted section is displayed; and also that of sudden contraction and expansion of the pipe. It is remarkable that, whereas so

THREE LIFT GASHOLDER

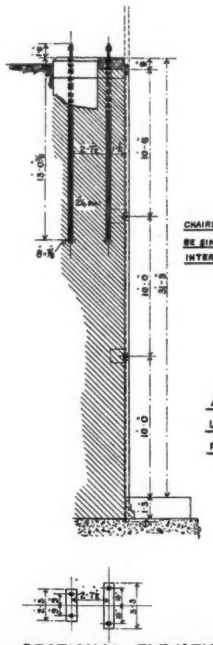
SUTTON CAS-WORKS

Nº 1.

INLET AND OUTLET PIPES. TANK GUIDES. HOLDING-DOWN BOLTS. &c



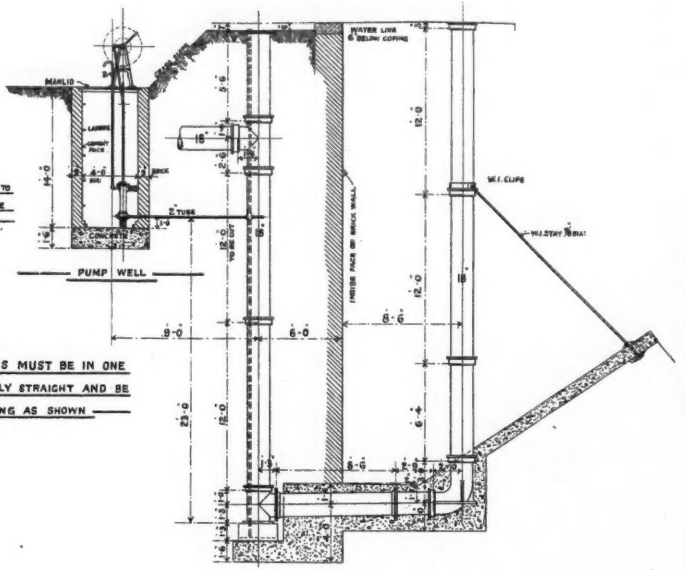
SIDE VIEW — FRONT VIEW



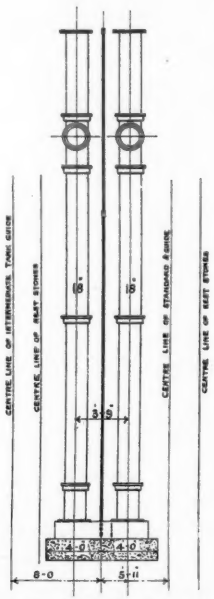
CHAIRS FOR STANDARD GUIDES TO BE SIMILAR TO THOSE FOR THE INTERMEDIATE GUIDES

ELEVATION OF TANK GUIDES

ALL TANK GUIDES MUST BE IN ONE LENGTH & PERFECTLY STRAIGHT AND BE PREPARED FOR FIXING AS SHOWN



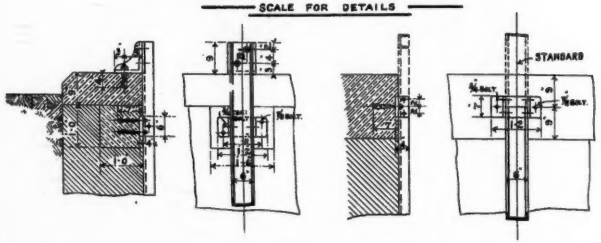
SECTIONAL ELEVATION & PLAN OF HOLDING DOWN BOLTS & PLATES, ALSO GUIDES OPPOSITE STANDARDS



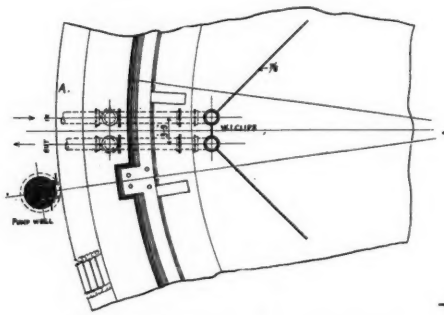
ELEVATION OF INLET & OUTLET PIPES — BACK ELEVATION OF INLET & OUTLET PIPES

INLET AND OUTLET PIPES WILL BE TESTED TO A PRESSURE OF 20 LBS PER SQUARE INCH AFTER FIXING & MUST BE PROVED PERFECTLY SOUND

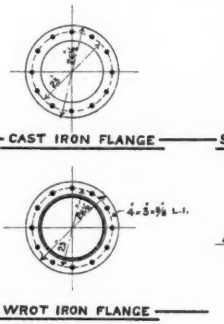
SHEWING CHAIRS AND BRACKETS FOR SAME — SEE DETAILS BELOW



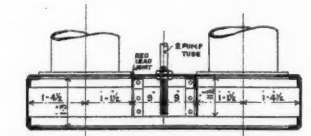
INTERMEDIATE TANK GUIDES — STANDARD TANK GUIDE



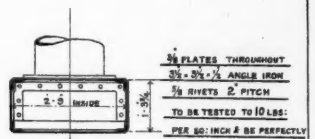
PART PLAN OF TANK AT INLET & OUTLET PIPES



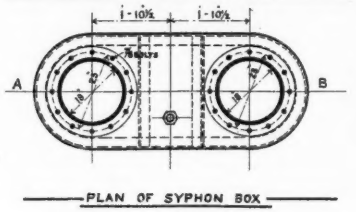
CAST IRON FLANGE — WROT IRON FLANGE



SECTIONAL ELEVATION OF SYPHON BOX AT A.B.



SECTION AT C.D.



PLAN OF SYPHON BOX

NOTE!

ALL IRONWORK SHOWN ON THIS DRAWING EXCEPT H.D. BOLTS TO BE FIXED BY THE CONTRACTOR FOR THE GASHOLDER.

ALL CASTINGS FOR TANK GUIDES TO BE ⅞" METAL
& TANK BOLTS ⅞ DIA: BOLTS THROUGH GUIDES ¾ DIA:

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F.S CRIPPS AMICE ENGINEER

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long as stream-line motion takes place, there is nothing between the cases of expansion and contraction to indicate any differences of resistance to the flow—in the case of sudden expansion for sinuous or rotational motion, the eddying motion or disturbance produced in the water is very much greater, and points to what has been arrived at both on practical and experimental grounds—that the resistance in a sudden enlargement of a pipe is many times greater than a corresponding contraction, and in fact obeys a definite law. It is the opinion of "Nature" that Professor Hele-Shaw's investigations bid fair to bring hydrodynamics within the range of experimental sciences, and thus to remove the reproach of the mathematical theory of fluid motion that the conditions presumed by the mathematician differ considerably from those occurring in practice.

The Mission of the Gas-Engine.

Mr. Sidney A. Reeve, described as Adjunct Professor of Steam Engineering at the Worcester Polytechnic Institute, has contributed to the American "Railroad Gazette" a thoughtful series of articles on "The Gas-Engine and its Mission." He brings a formidable indictment against the Otto type of gas-engine, on the score of its mechanical imperfections; but he admits that, notwithstanding these defects, the engine is pushing itself steadily, and of late rapidly, into recognition as a standard and popular prime mover. He seeks for the cause of this phenomenon, and he finds it in the demand of the day for mechanical power, not only cheaply developed, but also cheaply subdivided and distributed. Hence it is concluded "that the gas-engine has spread in use, not because it is efficient, not because it is mechanically attractive, but because its source of power—gas—is a fluid cheaply and conveniently transportable from a central source to a myriad of distant and isolated points of consumption." It is found, further, that the considerations of expense and mechanical crudity have been powerful obstacles in confining the expansive power of the single recommendation—transportability—within exceedingly narrow limits. The writer admits that the cost of transmitting power by means of town's gas-mains is "already much lower than for any other form of power transmission." But if the gas were compressed to the "common working pressure of 80 lbs. per square inch, a 2-inch pipe would suffice for 1000-horse power, and something less than 1-horse power per inch would be required to keep it in motion, while at higher pressures these figures become more insignificant." The author quotes Dr. Schilling in support of the contention that gas storage is as economically favourable as gas transmission. Wherefore he thinks that the ultimate destiny of the gas-engine is inestimably wider than that of the steam-engine, if only the former can be rendered as superior to the latter, mechanically, as its source of power is already superior to steam as regards storage, transmission, and subdivision.

COMMUNICATED ARTICLE.

THE THREE-LIFT GASHOLDER AT SUTTON.

WITH REMARKS ON CONSTRUCTION.

By F. S. Cripps, Assoc.M.Inst.C.E.

The gasholder about to be described and illustrated is one of only moderate dimensions—the inner lift being 117 feet in diameter by 30 ft. 9 in. deep; the middle lift, 119 ft. 6 in. in diameter by 30 ft. 9 in. deep; and the outer lift, 122 feet in diameter by 30 ft. 9 in. deep. The total effective capacity is one million cubic feet.*

Descriptions and drawings of very large gasholders have frequently been published, notably the following:—

1881.—Mr. G. Livesey's description of the 5½-million holder at the Old Kent Road.

1886.—Mr. C. Hunt's description of the two 6½-million holders at Birmingham.

1893.—Mr. F. Livesey's description and drawings of the colossal six-lift holder at East Greenwich, containing 12 million cubic feet of gas, and nearly 50 per cent. larger than any other holder in the world.

1893.—Mr. G. C. Trewby's description of the 8-million holder at Beckton.

1893.—Mr. W. Foulis's description of the 5¾-million holder at Glasgow.

1888.—The author's description of the 3¾-million holder erected by Messrs. C. & W. Walker, at Sydney.

There is, however, scarcely anything published illustrating what may be termed a moderate-sized holder; and yet for every very large holder constructed there are probably a dozen of more moderate dimensions erected.

In designing the Sutton gasholder, the strains have been determined and the various parts proportioned accordingly. And in this connection it may be remarked that the strains on a gasholder are of a very complex character, and are derived not simply from the force of wind pressure without or from the gas pressure within, but from (what is often lost sight of) the weight of the various parts of the structure itself setting up what may be termed structural strains, and also strains due to the elasticity of materials and accidental circumstances. All of these demand that calculation or estimation of strains due to all known causes (generally termed "theory") shall be supplemented by experience (generally called "practice"); otherwise the structure designed may be lacking in structural stiffness.

The drawings submitted of the Sutton gasholder are reproductions of the actual working drawings used in its construction and erection; and, with the exception of a few full-size details and rivet tables, they represent all that is needed in such a case. And here it may be pointed out that if gas companies would but provide drawings that could be sent straight into the manufacturer's works, an enormous saving in time would result. Not unfrequently work has to stand for months before even the iron can be ordered, because the drawings supplied are often such that no contractor can use; they have to be examined, modified, and re-made all over again. This not only involves delay, but also extra cost; as the contractor is compelled, when tendering, to allow for making these drawings, and for the extra office work and loss of time entailed.

For convenience of reference to the drawings, the description of the gasholder will be divided as follows:—

I.—Tank ironwork (Drawing No. 1).

II.—Guide-framing (Drawings Nos. 2, 3, and 5).

III.—Holder and guide-rollers (Drawings Nos. 4 and 5).

I.—*The "Tank Ironwork"* consists of the inlet and outlet pipes, the tank guides, and the holding-down bolts. I will treat of them in the order named.

Inlet and Outlet Pipes.

It will be observed from the drawings that the inlet and outlet pipes have been placed close together, because the advantage to be obtained by putting them far apart, or on opposite sides of the tank, would not compensate for the additional expense it would involve. In works where there is only *one* gasholder, it is desirable to keep them wide apart, otherwise the gas would have a tendency to pass in by the inlet-pipe and out by the outlet-pipe without properly mixing with the gas already in the holder; and therefore the quality of the gas supplied might vary considerably. But where there is more than one gasholder, it is seldom necessary to pass the gas in and out of the same holder at the same time.

The pipes are constructed of cast-iron, except where they pass under the wall of the tank, where some settlement might take place, and crack the pipe if made of cast-iron. Here, a short length of wrought-iron pipe is introduced, as shown on the drawing.

Frequently inlet and outlet pipes are made of wrought iron throughout. But unless they are very large, and the tank is a very deep one, there is no advantage in making them so, as there are more joints to leak, and the accumulation of naphthalene is encouraged by the sharp corners and edges, and by the greater chilling effect of the thin plates. In very large gasholders, where the inlet and outlet exceed 24 inches diameter, possibly wrought iron is preferable, on account of reducing the load on the foundations. They are then less likely to sink and get out of the upright.

Attention may be drawn to the peculiar construction of the cast-iron duck-foot bend, which is not only lighter than usual, but has been designed to avoid the tendency to crack from contraction strains to which the old-fashioned duck-foot bend is so addicted.

The principal novelties in connection with the inlet and outlet of this gasholder are the shallow syphon-box common to both inlet and outlet, and in the arrangement for pumping. This shallow box does away with the deep cast-iron syphons which in the ordinary way necessitate excavating to a great depth below the foundations of the tank wall, and which in the case of Sutton was particularly undesirable. The syphon-box is of wrought iron, and drains the water from both inlet and outlet, though the gas is kept separate by means of the division-plate. It is of large holding capacity, though shallow, and gives a very firm base upon which to stand the pipes outside the tank. Should either of the pipes inside the tank become stopped, the gas supply would not be cut off, as immediate relief would be given by the gas overcoming the slight seal of the division-plate, and passing under it to the other pipe. If it is desired to clean out the pipes, the holder must be lowered, when admission can be obtained through the Livesey manlid in the usual way.

That costly appendage to most gasholders—the so-called "dry well" surrounding the inlet and outlet pipes—has been abolished. This admits of placing the pipes close to the outside of the tank wall; thereby further reducing the cost of construction. A small "pump-well," quite separate from the inlet and outlet pipes, has been adopted, and which only contains the pump. The pump-well is 4 feet in diameter, and only of sufficient depth to admit of fixing the pump at the most convenient level for lifting the water easily from below—say, 26 feet above the syphon-box level. The lift and force pump is easy of access, and is worked comfortably by winch handles from the ground above. In some cases, separate pumps are fixed inside both the inlet and outlet pipes; but they are a great obstruction,

* It is only right to call special attention to the fact that both the tank and the holder referred to in this article are being constructed to the designs of Mr. Cripps, the Consulting Engineer of the Sutton Gas Company, and the whole of the work is being carried out under his superintendence.—Ed. J. G. L.

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and must necessarily be removed before access can be obtained to the interior of the pipes at any time. The pumps also are difficult to get at for repairs in such a case. Hence the separate pump-well, with a single pump, appears the most advantageous system.

Instead of the pumping-tubes passing down the inside of the inlet and outlet pipes in the ordinary way, a single tube, kept quite distinct from the pipes, extends from the ground to the interior of the syphon-box below, but not so low as to unseal the diaphragm plate. The tube is connected by a cross pipe to the pump in the pump-well above. The tubes are so arranged as to be easily cleared of obstructions at any time.

Tank Guides.

The 28 channel tank guides are of wrought iron. Those opposite the standards are carried up so as to form a continuous path from the bottom of the tank to the top of standard. It is a very bad practice to set the tank guides out of line with the standard guides; they should be quite flush on the face (*i.e.*, neither in advance of the other) and of the same section, for reasons which will be apparent hereafter when considering the arrangement of roller carriages. The intermediate guides extend a few inches above the top of the coping, because, should the overflow get choked and the tank become too full of water, it prevents any possibility of an accident occurring by the holder lodging on the coping or guides. In the Sutton holder, a cast-iron bracket behind the guide gives a finish to it, as well as stiffens the attachment where the guide projects above the tank.

Some gasholders have no *intermediate* tank guides; but it may be safely affirmed that no gasholders are too small for such guides unless the standards or columns are *very* close together—much too close for economy. It is needless to say that all tank guides should be fixed perfectly plumb, and to the exact radius from the centre of the tank. In these days, gasholders are constructed to exact measurements, and nothing is left to final closing dimensions, as it used to be. The guides should back solidly against the tank wall.

Holding-down Bolts and Plates.

The object has been, in arranging these bolts, to obtain a good grip on the tank wall without weakening it. To this end the front foundation bolts are kept farther back from the face of the wall than usual, and two anchor plates instead of four are adopted. The bolts are built in *loose* (as usual), to allow of slight adjustment when fixing the standards. After the standards are fixed, the bolts are grouted in solid with cement, as well as the interior of the cast-iron standard base; thus making a very firm attachment. The standard is attached to the front of the base and base stones in a special manner, as shown on drawing No. 5.

TECHNICAL RECORD.

SOUTHERN DISTRICT ASSOCIATION OF GAS ENGINEERS.

The Excursion Meeting.

The May Meeting of the Southern District Association of Gas Managers took place on Thursday, under the presidency of Mr. R. Beynon, of Torquay. By the kindness of the Directors of the Brentford Gas Company, the day was devoted to inspecting their works at Brentford and Southall. Had the weather only been propitious, the programme would have been as enjoyable as it was edifying; but a more inclement day could hardly have been found during the past year. Undeterred, however, by the rain, a numerous party of members put in an appearance at Brentford at the appointed time, and were received by the Engineer, Mr. J. Husband, who conducted them over the carbonizing part of the establishment, and explained the working of the inclined retorts and the carburetted water-gas plant. Brentford is a recognized show-place for the inclined-retort system; and it is unnecessary to describe how perfectly the work is done here. It may not, however, be superfluous to repeat the observation that the Brentford Directors have "burnt their boats;" every cubic foot of gas made on these works being by means of inclined retorts, supplemented with a Humphreys-Glasgow carburetted water-gas installation. Hence it is no wonder that Brentford is a place of pilgrimage for the progressive gas engineers of two continents.

After the inspection of the works, the visitors were hospitably entertained to lunch by the Directors, represented by Mr. W. Croxford, the veteran Secretary of the Company, and Mr. Husband, both of whom gave expression to the good feeling entertained by the Board for the Association. After lunch there was a brief interval of formal business; four new members being added to the Association. Their names are: Mr. Henry Morley, of Cardiff; Mr. J. F. Wicks, of High Wycombe; Mr. W. Bugby, of Southall; and Mr. H. D. Duesbury, of Broxbourne. This done, and the needful acknowledgments paid to the hosts, the party left in carriages for Southall, where more inclined retorts, as well as sulphate of ammonia plant, were inspected. A return drive to Richmond, for tea at the Star and Garter, finished a very full day.

MIDLAND ASSOCIATION OF GAS MANAGERS.

Excursion Meeting at Wellingborough.

Notwithstanding the very unpropitious conditions of weather prevailing last Thursday, the Midland Association members assembled in good numbers to take part in the Spring Excursion Meeting, which this year was fixed at Wellingborough, in order to afford an opportunity for inspecting the new retort-house now being fitted up at the works over which the President of the Association, Mr. J. T. Lewis, has control. There were some 40 members and visitors present at the Gas Offices when at eleven o'clock the Chairman of the Wellingborough Gas Company (Mr. W. Woolston) offered a very hearty welcome to the Association on his own behalf and that of the Board. Mr. Lewis also expressed the pleasure he felt at finding that so many of his *confrères* had assembled to meet his Directors and inspect his works—most of them for the first time. Mr. J. S. Reeves, the Vice-President of the Association, acknowledged their indebtedness for the kindly way in which the members had been received.

Brakes were then requisitioned for a drive to the gas-works; and an hour was profitably employed in a close inspection of the new retort-house, which is now rapidly approaching the stage when all the constructional details—apart from its eventual fitting up—can be fairly appreciated. The contrast between what this house will be and the present house and its predecessor (which is still standing as a curiosity of the olden times, back in the year 1833), excited much remark among the visitors to the works.

The new retort-house and coal-store are one building 88 feet long and 64 feet wide between the walls. The retort-house contains six single benches of retorts, each containing eight 22 inch by 16 inch ⌂ retorts, with West's regenerator furnaces and settings. There is a stage-floor extending between the benches and the retort-house wall, composed of concrete arches supported by longitudinal and cross girders spanning between the benches and the walls. The surface of the stage-floor is covered with special paving bricks except near the benches, where the floor is of cast-iron chequered plates. The benches are well braced together with H-steel buckstays, having cross tie girders above the bench for supporting the hydraulic, gas, and tar mains. The mouthpieces are fitted with self-sealing lids and fastenings arranged to suit West's stoking machinery; and they are well stayed to the benches by channel steel mouthpiece supports, set up in position by wedges attached to the buckstays. The hydraulic mains are of steel, and of ⊔-section; and the gas and tar outlet-valves are on West's latest principle. They are worked in connection with a special tar-vessel at the end of the retort-bench, and so arranged that the tar is taken away from the hydraulic main as fast as it is deposited. The mains will therefore be constantly clean.

West's manual charging and drawing machines, complete with steam-engine and coal-breaker, elevator, and overhead coal-hopper, have been installed in the retort-house, for the purpose of charging and drawing the retorts; the plant being similar to that which has been at work with success for some years at the Rushden and Higham Ferrers Gas-Works, where until recently Mr. Lewis was the Engineer and Manager. After the coke is drawn from the retorts, it is shot below the stage-floor through shoots leading into coke-waggons running upon rails. These waggons will convey the coke outside the retort-house, and tip it to the foot of the elevator, which will raise it to a screen and separate it into three sizes; the dust and small being received into overhead hoppers provided with doors for filling carts, and the large pieces being sent forward and stored in the yard.

The whole of the contract for the interior of the retort-house—comprising the stage-floor, regenerator retort-settings, and iron-work for the benches, together with the stoking machinery and coke-handling plant—was entrusted to West's Gas Improvement Company, Limited, of Manchester.

The inspection over, a temporary stoppage of the rain was taken advantage of for a drive through some of the main parts of the town, in order to afford an opportunity for the party to appreciate the rapid growth of houses of the better class in the locality. The drive ended at the Hind Hotel, where the members and a few local friends had been invited to lunch by the Directors of the Gas Company. At the close of a very enjoyable repast, Mr. Lewis, in the chair, gave the toast of "The Queen," and the Chairman of the Company proposed "Success to the Midland Association of Gas Managers," to which the President, in fitting terms, replied. The only other toast submitted was that of "Prosperity to the Wellingborough Gas Company," by Mr. Reeves, and responded to by Mr. W. Wyldes, the Vice-Chairman, and by Mr. S. H. Kimbell, the Secretary.

Before separating, the Hon. Secretary (Mr. C. Meiklejohn, of Rugby) introduced the only formal business needing to be transacted during the day—the confirmation of the minutes of the previous meeting, and the proposals for new members. The minutes were duly read and passed; and the following were elected members of the Association: Mr. Joseph Braithwaite, Manager of the Wrexham Gas-Works; Mr. Henry Shepherd, Manager of the Brownhills Gas-Works, near Walsall; and Mr. Frederick Lee, of the Hinckley Gas-Works.

A drive through some pretty country roads to the seat of the

Marquis of Northampton was then commenced; and eventually Castle Ashby was seen from the distance through a rain-storm that continued with almost relentless severity till Wellingborough was again reached. The party went through the programme, however, regardless of the wet, and were certainly rewarded by seeing the lovely gardens and glass-houses for which the place is so justly celebrated, though not to such advantage as would have been possible had the weather not been altogether against outdoor exercises of any kind. High-tea was served in the village; and the return drive was made through Grendon.

Mr. Lewis is certainly to be heartily congratulated on the admirable arrangements he made for the day's outing—a trip only marred, in fact, by the wretched weather and by a carriage accident on the way back, from which, unfortunately, Mr. Lewis was himself the chief sufferer.

The accident referred to above was the break-down of a small waggonette in which Mr. Lewis and four others of the party were riding, and all of whom escaped with only a severe shaking excepting Mr. Lewis himself. He was thrown violently to the ground on his right shoulder. On arriving at Wellingborough, he was medically examined, when it was found that the collar-bone was fractured. We are pleased to learn that up to yesterday Mr. Lewis was progressing satisfactorily, and hoped to be quite right again in a few weeks.

MANCHESTER DISTRICT INSTITUTION OF GAS ENGINEERS.

Quarterly Meeting at Morecambe.

Atmospheric conditions were certainly more in favour of the Manchester District Institution excursion meeting on Saturday than prevailed the previous Thursday, when the Southern and Midland Gas Managers had their annual outings. Morecambe was the place chosen for the trip; and though bright genial weather—the one essential for the thorough enjoyment of a day at a seaside resort—did not favour the members, the rain was not a serious interference with the due carrying out of the programme of arrangements.

The party assembled at Morecambe shortly after mid-day; and were met by Mr. William Duff, the Manager of the Morecambe Gas Company, who was accompanied by his Chairman, Mr. W. G. Welch, and some other members of his Board. A visit of inspection to the gas-works was first made; and here the extensive reconstruction of the retort-house, and other enlargements now being carried out in nearly every department of the works, engaged the attention of the visitors for close upon an hour. The extraordinary development of Morecambe of late years has severely taxed the resources of the gas-works; and the Board are to be heartily commended for undertaking so radical a scheme of enlargement in order to meet the prospective wants of the town for many years to come.

An adjournment was then made to the King's Arms Hotel, where the Chairman and Directors of the Gas Company entertained the members and a few friends to lunch—a courtesy much appreciated, and duly acknowledged afterwards by a hearty vote of thanks being passed to them, on the motion of Mr. Isaac Carr, seconded by Mr. R. G. Shadbolt, the Senior Vice-President of the Institution. The toast of "Success to the Institution" was duly given by Mr. Welch, and responded to by Mr. W. S. Haddock, the President.

In dull and threatening weather—which, however, did not turn to rain till just before the return journey was completed—the party then set off for a long drive to Caton, passing Lancaster, Halton, and Quernmore Park, and home by Skerton and the Carnforth Road to Slyne.

After high-tea at the hotel, the Hon. Secretary (Mr. S. S. Mellor, of Norwich) obtained the confirmation of his minutes of the previous meeting; and subsequently six new members were added to the roll of the Institution—Mr. E. E. J. Anderson, of Ripon; Mr. G. S. Frith, of Frodsham; Mr. J. H. Parsons, of Buckley; Mr. F. Thorpe, of Colne; Mr. F. A. Winstanley, of Rotherham; and Mr. H. Worsley, of Golborne. The President, in a sympathetic speech, proposed a vote of condolence with the family of the late Mr. W. Smith, of Hyde. This was seconded by Mr. Shadbolt, and carried. It was reported that Mr. Mellor had received a letter from the Hon. Secretary of the North of England Association with reference to compensation to gas-works employees under the Employers Liability Act; and the Committee of the Institution will consider the letter, and later on advise the members further about the question.

Those who were not staying for the week-end at Morecambe left the town about 7 o'clock, after further acknowledgments of their indebtedness to Mr. Duff and his Directors for their exertions to make the proceedings so successful as they had turned out.

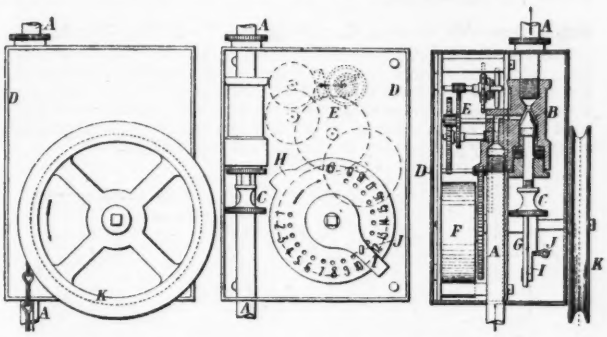
The Limits of Inflammability of Carbon Monoxide.—This subject was recently brought before the Paris Academy of Sciences by MM. H. Le Chatelier and Boudouard. They showed that, under ordinary conditions, gaseous mixtures containing between 16 and 75 per cent. of carbonic oxide are inflammable.

REGISTER OF PATENTS.

Extinguishing Lights at a Predetermined Time.—Gunning, J., of Bournemouth. No. 7011; March 17, 1897.

This is a detent appliance which can be set so that at a predetermined time it acts on a valve or cock in a gas-service pipe, thus causing the extinction of the lights.

The gas-service pipe A has a chamber provided with a conical valve B, to the stem of which is attached a head or button C. Within a casing D, through which the pipe passes, is clockwork E, driven by a spring F, at a speed determined by an escapement and balance-wheel in the usual way; the speed being preferably such that the spindle of the main spring revolves once in twenty-four hours. On the spindle is fixed a disc G (having a number of holes circularly arranged and marked), which has



at one part of its circumference a projection H. On its boss is fitted, free to turn, an arm I, which can be held in any desired position on the face of the disc by a pin J inserted through it into one of the holes of the disc. Outside the casing a wheel K is fixed on the spindle of the main spring; and to this wheel may be attached a chain for turning it from a distance.

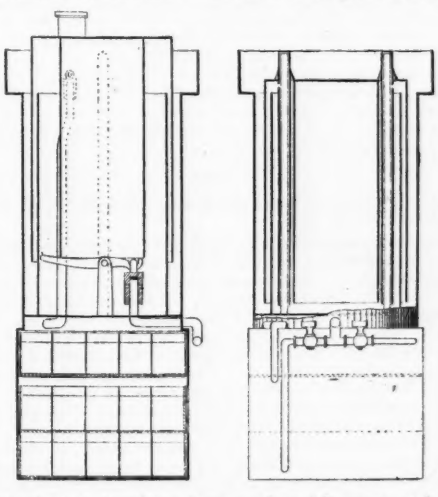
If it is desired to extinguish the lights after a certain number of hours—say, 10—the cover of the casing is opened, and the arm I is fixed in a position showing at its left side the numeral 10. The cover being then closed, the wheel K is put on the spindle and turned in the direction of the arrow. The spring is thus wound up; and the projection H, acting on the head C, opens the valve, and allows gas to pass to the burners. On releasing the wheel, the disc is turned by the spring in the direction of the arrow (at a speed determined by the clockwork), until the arm I comes to act on the head C, pushing it up, closing the valve, and extinguishing all the lights supplied by the service-pipe.

Incandescent Gas-Burners.—Crowe, R., and Tee, H., of Liverpool. No. 10,226; April 24, 1897.

In order to provide for the proper proportioning of the air and gas in an incandescent gas-burner—depending on the pressure at which the gas is supplied—at the point where the gas is discharged into the mixing-tube, it is supplied with a loose nozzle-plate, having a single central hole in it, through which the gas is discharged into the burner mixing-tube. The size of the hole used in any given burner is of a dimension having some proportional relevance to the pressure in each application or case; and, in practice, the person fitting the lamps would, after having first tested the pressure, fit a plate on to the gas-nipple marked for the proper pressure. The disc or plates are held on to the nipple-head by a separate cap or flanged ring; or the plate itself may be in the form of a flanged plate fitting over the gas-nipple. As a further feature of the invention, above the mixing-tube, and within the head of the burner, a disc is provided, against which the stream of gas and air, coming from the mixing-tube, strikes, and by which it is deflected outwards.

Generating Acetylene Gas.—Evans, E., of Llanrwst. No. 10,508; April 27, 1897.

This invention is based upon the principle of a gradual and regulated addition of water to the carbide, instead of, as is often the case, a gradual addition of carbide to the water. Instead of having the carbide all in a



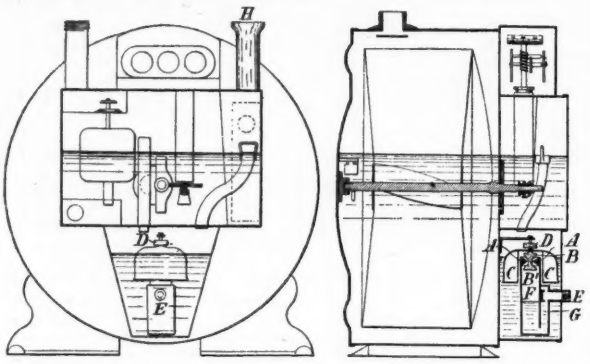
single receptacle, it is placed in a large number of drawers; and no water can run into the second or any subsequent drawer until the first or prior ones in their order have been filled with water. Then, when sufficient

gas has collected to fill the holder or raise it to a given point, or to lower the water in the holder to a given point, the valve regulating the supply of water is closed.

As shown, the series of drawers is divided into compartments, following each other consecutively, and each having a lip delivering water into the next following compartment, and so on. The drawers are filled to about one-third of their height with calcium carbide; and the water runs only into the first compartment. When the calcium carbide in this compartment is all consumed, the water overflows the lip of the compartment into the next, and so on until all the compartments are used up. The drawers are so arranged that the last one is closed off from the others until such time as the water begins to enter it. The supply to the first compartment of the first drawer is then cut off, and a separate supply to the last drawer is turned on, and the communication between the drawers cut off, and the communication also from all the first drawers with the holder. The drawers can now be taken out and recharged, while the last drawer is being used up.

Gas-Meters.—Weiskirchen, E., of Brussels. No. 13,796; June 4, 1897.

The inventor describes his arrangement as being one to "transform the gas-meter to which it is applied into a safety measuring apparatus, in the sense that it secures the exact registration of the gas that passes through the meter, it does not allow of the removal from the meter of the least quantity of the water which has been put there for adjusting it, and it consequently prevents any fraudulent subtraction of gas."



The safety-device comprises a syphon made of two tubes; one F longer and of a smaller diameter than the other tube G. The tubes are fixed, the one F within the other G; and they communicate at the bottom. The tube F is perforated at its under part for establishing the communication. The overflow-tube E is in direct communication with the tube G, and is completely insulated from the other tube F. The upper extremity of the tube F is provided with a valve-seat A, through which passes a rod carrying two valves B B^1. This rod is connected with a float C, in the dome of which are provided openings allowing the escape of the air and the rising and sinking movement of the float. Over the latter is a weight D, supported by a rod fixed on the cistern, and serving as a stop for the float, in order to limit the rising movement at the moment when the meter is filled with water for its adjustment.

The device prevents the drawing off of water from the meter, either by inflation or by aspiration—by inflation by closing all the burners and blowing air through one open burner, or by driving the air through the inlet-pipe H, which, in either case, makes the water leave through the syphon, or also by blowing intermittently through the orifice of the syphon, which makes the water leave through this orifice; or by aspiration, by sucking through the orifice of the syphon. In the first, second, and fourth cases, the upper valve B descends and closes the passage; in the third case, it is the lower valve B^1 which rises and produces the closure.

Gas-Engines.—Capel, H. C., of Dalston. No. 14,455; June 15, 1897.

The object of this invention is to diminish the capacity of the chamber between the exhaust-valve and the cylinder of gas-engines, by doing away with the port usually placed between the valve and cylinder, and in this way reduce to a minimum the cooling surface exposed to the hot gases, without the disadvantages hitherto introduced when this has been done by the use of loose valve-seat bushes. For this purpose, the valve-seats of the exhaust and admission valves are cast in one with the explosion-chamber casing, with ports projecting through the water-jacket space, so that the valve-seats are about in a line with the bottom of the interior of the cylinder. An opening and cover are provided in the explosion-chamber casing, opposite the valves, for the purpose of machining the valve-seats and inserting and removing the valves.

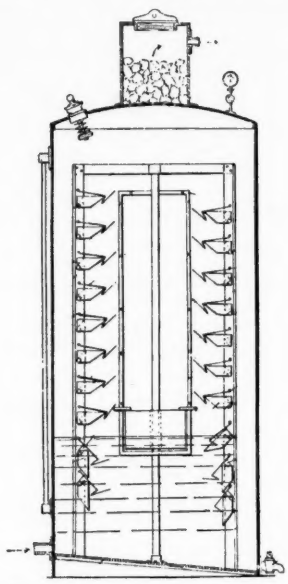
Pilot-Lights for Incandescent Burners.—Momand, R., of New York. No. 3004; Feb. 5, 1898.

The gas-passages through the valve-plug of this burner are so disposed relatively to each other that, when the valve-plug is partially rotated to cut off the main gas supply, the first movement brings the passage to the pilot-light into communication with the inlet-port; thus immediately establishing a flow of gas to the pilot-flame before the main gas supply has appreciably diminished. When the valve-plug is rotated to open the main gas supply, the passage to the pilot-light will be maintained open until the main gas-supply passage is fully opened; thus ensuring a supply of gas to the pilot-flame until the main gas supply shall have reached the point of consumption where it will be ignited by the pilot-flame. The pilot-flame is maintained by a supply of gas contained in a small reservoir in the centre of the main burner, even after the gas supply is cut off, which ensures the main gas supply being ignited in case the valve is operated quickly and the passages to the pilot-flame closed suddenly when the main gas-passage is opened. The hollow bell-shaped gas reservoir referred to acts also as a spreader of the mixed gas and air.

Generating Acetylene.—Schlüter, C. H. P., and Lüdemann, C. L. F., of Hamburg. No. 5594; March 7, 1898.

This is an acetylene generator of the type in which the water is automatically supplied to the calcium carbide in very small proportion; so that over-heating and consequent danger during the working of the apparatus are said to be avoided.

The apparatus (as shown) consists of a container, provided with a sloping bottom. In the centre is a rod fixed to the bottom, and serving as a guide for a float, which ascends with the level of the water admitted into the container. The bottom also carries an upright angle-iron frame, having scoops or similar holders pivoted in slots in one of the sides of the angle iron. These scoops are to contain the calcium carbide, and are retained in a horizontal position by spring or flexible engaging arms, made of wire or metal strips. These pivoted arms have hooked-shaped ends, which catch the oblique side of the scoops and hold the latter in the desired position.



The water enters the container through the lower left-hand connection; and when it has risen to a certain height, it lifts the float. When the latter is passing the lowest scoops, the projection on the float raises an engaging arm, so that the scoop is liberated, and, falling by the weight of carbide in it, precipitates its contents into the water. Acetylene is thus evolved, and passes through the perforated top of the container, and through a filter to the gasholder by way of the pipe at the top right-hand side. When the gasholder bell is in its raised position, water ceases to flow into the generator; but it begins again when the gas has been withdrawn from the holder, so that the float is raised, and further portions of carbide are precipitated from the scoops.

APPLICATIONS FOR LETTERS PATENT.

10,613.—Westinghouse, G., and Ruud, E., "Internal combustion engines." May 9.

10,627.—M'Kenzie, J. D., and Macdonald, K. A., "Gas and oil engines." May 10.

10,648.—Tavernor, J. M., and Thornton, W. A., "Governors for controlling the flow and pressure of acetylene and other gas." May 10.

10,659.—Sutton, B., "Gas and other taps." May 10.

10,684.—Barltrop, W. P., "Acetylene lamps." May 10.

10,692.—Dawson, J. W., "Generation and storage of acetylene gas." A communication from J. Lounge. May 10.

10,746.—Simon, H., "Valves used in plant for the manufacture of gas." May 11.

10,763.—Sartig, J., "Treating calcium carbide for use in acetylene generators." May 11.

10,815.—Windham, F., "Improvements in or relating to the burning of acetylene gas." May 11.

10,834.—Hopp, G., "Incandescent gas-burners." May 12.

10,854.—Lloyd, A. L., "Full-way steel-pipe water conduits." May 12.

10,906.—Rothgiesser, G., "Improved process for mixing combustible gases with air." May 12.

10,927.—Phillips, R., "Hot moist-air chamber for gas-stoves." May 13.

10,938.—Varon, J., "Acetylene gas-producing apparatus." May 13.

10,979.—Crudgington, H. & W., and Ridings, W. R., "Glass globes and chimneys." May 13.

10,984.—Murray, F., "Generation and supply of acetylene gas." A communication from Sir C. S. Forbes, Bart. May 13.

10,985.—Bilbie, J., and Drivet, H., "Acetylene generators or lamps." May 13.

11,006.—Falk, S., "Smoke tops for gas or lamp globes, chimneys, and the like." May 13.

Private Bill Legislation.—A parliamentary paper recently issued states that during the years 1891-97 the aggregate number of petitions for Private Bills deposited in the Private Bill Office was 1106, or an average of 158 a year; of Bills read a first time in the House of Commons, 1052; of Bills considered in the House of Lords under Standing Order 79, 531; of Bills first so considered in the House of Lords and brought from the Lords, 430; of Bills (estate, &c.) originated in, and brought from the Lords, 11; of Bills decided on by opposed Committees, 347; of Bills treated as unopposed, and referred to the Chairman of Ways and Means, 592; and of Bills that received the Royal Assent, 898, or an average of a fraction over 128 a year.

CORRESPONDENCE.

[*We are not responsible for the opinions expressed by correspondents.*]

The Question of Tar.—Is Association Desirable?

Sir,—Referring to the query propounded by you as above, permit me to say why, in my opinion, association is desirable.

The manufacturers of tar are suffering as those of sulphate of ammonia have for want of proper association to safeguard the many-sided interests of this residual. In Mr. George Livesey's admirable letter in the last issue of the "Journal" the matter is put into a small compass, and the deplorable position explained without need of further comment on it. What can be done to improve the market is a question that could better be dealt with perhaps by a representative body than by isolated undertakings struggling for themselves.

Mr. Livesey remarks that "we have our two separate Institutions," and though their union is most desirable, it cannot at present be accomplished, whatever may ultimately be the case. In my judgment, something might be done if the Councils of these Institutions were to take a broad view of the position, and unite for mutual action with a view to forming a Tar Manufacturers' Association. The Councils might call in London a meeting of those interested, who, after careful consideration, might decide upon the amount of subscription necessary for preliminary work and investigation, for (say) twelve months. Such a meeting might elect a representative Committee for the purpose of considering the various questions relating to the utilization of tar—such as for distillation, fuel purposes, asphalting, briquette manufacture, and preservative purposes (tarring fences, sheds, and ironwork)—as well as the much-vexed question of the enrichment of coal gas by tar. In fact, such a Committee might collect all available information upon the subject, and use it as deemed desirable. It might further be found advantageous to encourage research work in the direction of utilization, though, as you hint, it is this indirectly from which tar is suffering, mysterious as it appears.

That a practical outcome may be the result of the suggestions made by you, is a consummation to be wished.

Edward A. Harman.

Huddersfield, May 20, 1898.

Workmen's Compensation Insurance.

Sir,—I have read with interest the article in last Tuesday's "Journal" upon the "Cost of Insurance under the Workmen's Compensation Act," and also the letters of your correspondents thereon.

I should like to say that my remarks on this subject at the North of England Gas Managers' meeting were not intended to be in any way antagonistic to Insurance Companies. Beyond that, I think they have interpreted the responsibilities of Gas Companies under this Act much above what, in my opinion, they are likely to be, and have in consequence fixed a far higher rate than should be necessary, after allowing all and ample charges for the transaction and maintenance of their business, to cover any and all risks that may reasonably be expected to arise under the Act. I admit it is difficult to form a correct value of what such risks are likely to be in the future; but still I think past experience may go a long way to guide us in the matter.

You give the cost under the old terms to the South Metropolitan Company and my own Company as 3s. and 2s. per cent. respectively. I do not know upon what basis the South Metropolitan Company have compensated their workmen; but from what I know of the Chairman of the Company and its officials, I am quite sure it has been a generous one. In the case of my own Company, it has been usual to pay workmen injured in their service half such workmen's regular wages during disablement, in addition to medical fees and attendance. This, I believe, is exactly what the new Act provides for, with a limitation that no sick allowance is to exceed £1 per week. As to fatal accidents, we have had none, and consequently have had nothing to pay under this head. Now, if in the past such risks have been covered at a cost of 2s. per cent.—and I am not aware that accidents are likely to be more frequent in the future than they have been in the past—I fail to see anything in the new Act that should increase our liabilities to anything approaching a standard on which it is necessary to charge 25s. to cover such liabilities. Insurance Companies themselves, I imagine, are beginning to find out that they have made a mistake in fixing the rate too high, as offers are now being made on all hands to do business at a much lower charge; quotations having been made to this Company as low as 11s. 6d., which is less than half the rate first named. The Federated Association of Employers have, I understand, quite recently decided upon forming a mutual insurance fund of their own, for the protection of their members under the Act; and although the risks are very much greater to their workmen than those employed by Gas Companies, yet the rates fixed are very considerably lower than those proposed by Insurance Companies. For instance, shipbuilding—a very dangerous employment—is covered at about 15s. per cent.; while marine engineering, which is much more liable to accidents than our own employment, is only charged 10s. 6d. Why, then, I ask, should Gas Companies, whose risk is much less, be called upon to pay 25s.?

Personally, I am of opinion that the duties of Gas and Water Companies are already sufficiently multifarious without entering upon those of Insurance Companies; but until the latter Companies can see their way to quote prices not exceeding (say) 10s. per cent. to cover Gas Companies' liabilities under this Act, I shall be disposed to advise my Company not to insure unless it be by some scheme of mutual arrangement among Gas Companies themselves, which I am confident can be done at even a less rate than that I have named.

Thomas Bower.

West Hartlepool, May 19, 1898.

Sir,—I am informed by the Secretary of the Incorporated Gas Institute (Mr. W. T. Dunn) that a paper on the above subject is to be read at the forthcoming meeting at Belfast; and seeing that it is a matter which is engaging the serious attention of gas managers, it will be most opportune. I venture to suggest that, before deciding to insure against the risks imposed by the Act, gas managers should wait until after The Gas Institute meeting, when some united course of action may be decided upon.

It is generally considered that the rate fixed by the Associated Insurance Companies, of 25s. per cent., is much too high; and although some of them are quoting lower rates, I think no harm will be done by waiting until the matter has been further considered.

I have an offer at 12s. 6d. per cent., through what I believe is a substantial office.

J. H. Troughton, Hon. Secretary,
Eastern Counties Gas Managers' Association.

Newmarket, May 21, 1898.

The Recent Riots in Milan.

Sir,—It does not often happen, I suppose, to gas engineers and managers in England to have their works forcibly broken into by a riotous crowd, and their manufacture of gas ruthlessly stopped. This, however, was my experience at the Porta Nuova Gas-Works, Milan, during the recent riots; and as it may possibly be of some interest, I thought to place on record in your columns what occurred.

About ten o'clock on the morning of Saturday, the 7th inst., the principal door of the works was forced open, and a mob of well-dressed and well-fed workpeople gained entrance. The crowd was largely composed of young boys and girls; the latter being used as an advance guard to hinder any interference by force being made. Asking one or two of the rioters what they wanted, they replied that they did not know. Some, however, immediately found the steam-whistle in the exhauster-room, and sounded it so as to dismiss the men then at work. Others raked out the fires from the two boilers in service, and stopped the working of the exhausters and pumps. Passing on to the purifier-house, some boys amused themselves by scattering the air-plugs of the purifier covers about the house. Not understanding, perhaps, what damage could be done to the tower scrubbers and station meters, the rioters returned to the retort-houses, where they occupied themselves—assisted, perforce, by some of the stokers—by opening the lids of the 190 retorts then in work. Having accomplished this little task, no doubt to their own satisfaction, if not to mine, they withdrew from the works, taking, of course, all the stokers and other workmen with them, and threatening any who might think of re-starting the make of gas. By eleven o'clock, I was left, with six others, with very little gas in the holders, and the retort mouthpieces all in flames.

My first duty was to advise the Engineer of the larger and more important San Celso Gas-Works of what had occurred, so that it might be protected in case it became the scene of disorder later on, as proved to be the case. My second was to see what could be done to put the Porta Nuova works in order again. With my foreman, we closed the main outlet-valves of the purifiers, so as to keep what gas we then had in the holders; the rabble, meanwhile, being engaged in stopping an international train on the adjoining railway. Owing to the fewness of our numbers, it was impracticable to relight the boilers, so as to recommence our manufacture. Having provided, therefore, an escape for the remaining steam, we proceeded to close, without luting, the retort-lids, in order to prevent the coke from burning away within the retorts. Our efforts for the following forty-eight hours were directed to keeping the furnaces in order. When we were eventually enabled to begin charging, we naturally found the mouthpiece joints and retorts damaged to some extent.

Besides many other almost incredible exaggerations that have appeared in the London newspapers concerning the Milan riots, I believe it has also been stated that the town was left without gas. It is a tribute to the determination and energy of the Engineer of the Gas Company in Milan, Mr. Charles Bourne, Assoc.M.Inst.C.E., that not for a single night during the recent disturbances have the streets been unlighted.

C. E. Brackenbury, Assoc.M.Inst.C.E.

Porta Nuova Gas-Works, Milan, May 20, 1898.

Peebles Gas Governor.

Sir,—Mr. Simmance, in his letter of the 12th inst., says that a word will set me right. But seeing that I am right, no word of his can make me more so.

He says I claim a permanent leak in my governor. I do nothing of the kind. A permanent leak in a governor is old; and no one can claim it. Nor is it employed to correct a "shutting-up" tendency as Mr. Simmance supposes. He says that he wishes I had lodged a "proper objection," instead of writing to you. As to that, when I write to the "Journal," in which the governor in question is described and illustrated, stating that the so-called invention is a slavish copy of mine, I take the best way of making known the plagiarism.

Mr. Simmance invites me to argue the matter before the Comptroller. Let me assure him that the journey on my part is not needed. It is evident that Mr. Simmance does not know what the specific object of the permanent leak is; and it is marvellous that, in his letter, the only claim he puts forth for novelty is the stopping-up of a hole in the disc of my governor. If that can be called an invention, it can only excite surprise, and provoke a smile—perhaps a frown—in those who spend time and money in working out improvements. Imitation, it is said, is the sincerest flattery; and the shutting-up of a hole being the whole of Mr. Simmance's invention, many will wonder at the ease with which patents can be secured in this country. It may, however, ease his mind if I tell him that he can go on with the making of his un-holey governor, and so can anyone else, simply because I—for sufficient reasons—allowed my patent to lapse; and it includes all of any consequence that can be claimed for a loose disc governor.

D. Bruce Peebles.

Tay Works, Edinburgh, May 21, 1898.

Standardizing of Gas-Meter Indices.

Sir,—As the standardizing of gas-meter unions seems to be agitating the minds of the various Gas Institutions and Associations throughout the country, may I be allowed to draw the attention of gas-meter makers to something of equal importance—viz., the standardizing of gas-meter indices. More especially is this needed in wet meters; for there are, I venture to say, hardly two makers who construct their indices on the same lines.

I do not mean that this standardizing of meter-indices requires the services or intervention of the Board of Trade, with its attendant staff of testers, and the stamping of the index independent of the meter, which

idea was mooted some years ago. But there should be a mutual understanding among all the meter makers throughout the United Kingdom that each size meter shall have recorded on the test-dial in "drys," and on the test-drum in "wets," the same number of feet for testing purposes, consistent with their respective capacities.

This I take it would bring all capacities—per revolution, and per hour—into line; and all internal gear-work would thus become universal. It would, I am sure, save a great amount of time in the makers' testing-rooms, and greatly facilitate the work at the Government gas-meter testing-stations.

By way of illustration, take 20-light wet meters of various makers. Here you will find test-drums with 20, 30, 40, and even 50 feet marked upon them; and in the case of 20-light "drys," some have a 5-feet test-dial and others a 10-feet one. In larger size meters, this is all the more noticeable, especially in wet station meters.

I venture to say that the days of competition among gas-meter makers to get large capacities per revolution out of their respective meters (dry) is long past; and although fortunes have been squandered in various patent gas-meters (ordinary), what is known as the original square "Croll and Glover" pattern, is now recognized as the standard dry meter throughout the trade. Then why not go a step further, and by a mutual and amicable understanding among the makers have a uniform capacity and a standard index. Thus much confusion, and in some cases complications, would be avoided.

S. Church.

Clapham, S.W., May 18, 1898.

Proposed Association of Gas Companies.

Sir,—We are instructed to request you to be good enough to allow us to intimate through your columns that all Secretaries, Managers, or other officials of Gas Companies who may not have received special notice of the meeting to be held at the Westminster Palace Hotel on Tuesday, the 7th of June, with reference to the above subject, are invited to attend that meeting.

R. W. Cooper and Sons.

5, *Victoria Street, S.W., May* 20, 1898.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF LORDS.

The following further progress has been made with Bills:—

Bills brought from the Commons, read the first time, and referred to the Examiners: Carmarthen Improvement Bill, Cranbrook District Water Bill, Gloucester Gas Bill, Ilford Improvement Bill, Rhymney and Aber Valleys Gas and Water Bill, Southend Water Bill, Wigan Corporation Bill.

Bill read a second time: Gas Orders Confirmation Bill (No. 1).

Bill read a second time and committed: Staines Reservoirs Joint Committee Bill.

Bills reported: Enfield Gas Bill, Folkestone Corporation Water (Transfer) Bill [preamble not proved], Thanet Gas Bill [preamble not proved], York United Gas Bill.

Bills reported, with amendments: Felixstowe and Walton Water Bill, Filey Water and Gas Bill, Folkestone Water Bill, Halifax Corporation Bill, Ilkeston Corporation Bill, Kettering Water Bill, Newhaven and Seaford Water Bill, Newtown Water Bill, St. Anne's-on-the-Sea Gas Bill, Tynemouth Corporation Water Bill, Wath-upon-Dearne Urban District Council Bill.

Bills read the third time and passed: Bacup Corporation Water Bill, Hamilton Water Bill, Southend-on-Sea Gas Bill.

The Select Committee appointed to consider the Crawley and District Water Bill reported that the petitioners against it had no *locus standi*.

On the Select Committee appointed to consider the Rochdale and Todmorden Water Bills, Earl Craven was substituted for Lord Hay

Twelve petitions have been presented against the Wishaw Water Bill, among them being one from the Corporation of Glasgow.

HOUSE OF COMMONS.

The following further progress has been made with Bills:—

Bill read a second time and committed: Gainsborough Gas Bill.

Bills reported: Haslemere District Water and Gas Bill [preamble not proved], Plymouth and Stonehouse Gas Bill, Southampton Gas Bill, Wey Valley Water Bill.

Bills read the third time and passed: Carmarthen Improvement Bill, Cranbrook District Water Bill, Edinburgh and District Water Bill, Gloucester Gas Bill, Ilford Improvement Bill, Morley Corporation Gas Bill, Rhymney and Aber Valleys Gas and Water Bill, Southend Water Bill, Wigan Corporation Bill.

The consideration of The Gaslight and Coke Company Bill, as amended, was put down for last Friday; but it was deferred till yesterday. Mr. Pickersgill gave notice that on the Bill coming up he would move for the insertion of the following clause:—

Postponement of Conversions of Stock.—(1) The conversions of stock by this Act authorized shall not take effect unless and until the Company shall have reduced the price of gas sold by them to 2s. 6d. per 1000 cubic feet. (2) It shall not be lawful for the Company to raise the price so reduced unless by order of the Board of Trade, and to the extent allowed by such order. (3) The Board of Trade shall not make any such order unless they are satisfied, after an inquiry at which the London County Council and any Vestry or District Board of Works within the Company's area of supply shall be entitled to be heard, that some exceptional circumstances have arisen making it reasonably necessary that the increase of price asked for by the Company should be made. Any such order shall remain in force for such period only, not exceeding one year, as may be specified in such order.

The Corporation of Drogheda have withdrawn their petition against the Drogheda Gas Bill.

HOUSE OF LORDS COMMITTEE.

(*Before Lord* Herries, *Chairman, the Earl of* Chesterfield, *the Earl of* Gainsborough, *Lord* Churchill, *and the Marquis of* Ormonde.)

THANET GAS BILL.

This Bill, which had passed a Select Committee of the House of Commons (see *ante*, p. 722), came before the above-named Committee on Monday last week. The promoters were represented by Mr. Balfour Browne, Q.C., and Mr. Boyle; the petitioners against the Bill—the Corporation of Margate—by Mr. Freeman, Q.C., and Mr. Fleetwood Pritchard.

It appeared, from the opening statement of Counsel, that the Isle of Thanet Gas and Coke Company was originally formed under an Act granted in 1824. The business was increasing, the gas supplied in 1897 being 180,336,000 cubic feet, as against 62,490,000 cubic feet in 1880. The consumption had so grown that it had outrun the plant. The Company required to have further manufacturing and storage works, and had sought and found a suitable site for the purpose. There was practically no opposition to the measure, except as to the acquisition of the site. The petitioners said in their petition: "The lands which are described in the schedule to the Bill, and upon which the Company seek power to construct gas-works, are comprised within the area from which your petitioners derive the supply of water for the borough of Margate and the adjacent county; and your petitioners' adits are constructed in close proximity to, if not immediately under, the lands so proposed to be used. The use of the lands in question for the purpose of manufacturing gas and residual products is, your petitioners are advised, likely to occasion serious pollution of their water supply; and it is therefore submitted that the provisions of the Bill in this respect should not be allowed to become law. Great expense has been incurred by your petitioners in constructing their water-works, and the supply therefrom at the present time is excellent; and your petitioners regard with grave apprehension any proposals likely to occasion the contamination of the water." But it was contended that, if the Company were not authorized to take the site in question, the owners had a perfect right to put up cottages on it; and there would be likely to be more contamination of the water in that way than by the proposed works. The House of Commons insisted on the insertion of provisions requiring the works to be constructed in such a way as to be approved by an arbitrator, and as not to cause pollution. A clause to this effect was inserted in the Bill; and the promoters thought it was quite adequate. The petitioners, however, took an opposite view, and said in their petition: "Your petitioners are advised that there will in any case be serious risk of pollution to the water; but should your Right Honourable House think fit, notwithstanding the objection of your petitioners, to authorize the construction of gas-works in close proximity to the water-works, further and more adequate provisions should be made for protecting the latter works as far as possible, and for diminishing the risk of pollution in particular." But against this the promoters said that the matter would be fairly adjudicated upon by the arbitrator. The petitioners asked for control over the proposed works, and powers of inspection and penalties for infringement of the provisions of the Bill or the conditions imposed by the petitioners. The promoters held that it was not unreasonable for the petitioners to seek to impose conditions, and then to have penalties for the Company not carrying them out. The petitioners alleged that the additional capital asked for—viz., £100,000, with borrowing powers to the extent of £25,000—was in excess of the requirements of the Company, and said that no increase should be authorized without the most careful investigation as to the financial position and needs of the Company. But the Company had no interest in raising their capital unnecessarily, as it would be subject to the auction clauses. As to the petitioners' allegation that the illuminating power of the gas was unsatisfactory, it was pointed out that it was 14 candles, which was the illuminating power in a great many towns similarly situated to Margate. It was also stated that though 14 candles was the limit, the Company always supplied gas 1½ candles above this, so as to be on the safe side. Dealing with the Bill itself, Mr. Balfour Browne pointed to the clause framed for the protection of the Corporation, with a safeguard in the interest of the Company. The clause was as follows:

One month before constructing any works by this Act authorized, the Company shall submit plans and sections thereof to the Engineer of the Corporation of Margate (hereinafter called the Corporation Engineer), who may during the construction of such works on the lands described in the schedule to this Act, and for a period of twelve months after the construction of such works, inspect the same for the purpose of seeing that the same are constructed water-tight; and if in the opinion of the Corporation Engineer any alteration or strengthening of any of such works aforesaid be in his opinion necessary for the prevention of contamination of the water supply on or under land adjoining the lands aforesaid, he shall forthwith signify such opinion in writing to the Company, giving full details of the work which he considers necessary to be done to prevent such apprehended contamination, and the Company shall execute the said works in accordance with such requirements: Provided that in the event of any difference arising between the Engineer of the Company and the Corporation Engineer as to the reasonableness of any such requirement, the same shall be settled by an arbitrator to be appointed by the President of the Institution of Civil Engineers.

On April 29, 1898, the Directors wrote to the Corporation saying that while they were of opinion that the Company had great reason to complain of the way in which the opposition of the Corporation as to the scheduled land was, in the first instance, raised at the last moment, and also that after the decision of the Committee of the House of Commons such opposition should be continued, they were anxious, if possible, to avoid any conflict with their fellow-townsmen, and would be willing to abandon the intention to take the lands scheduled in the Bill, if the Corporation would indicate to them a site equally convenient and beneficial to the Company, upon the following conditions: (1) Progress of Bill to be suspended until, say, the middle of June. (2) The Corporation to indicate another site equally convenient and beneficial to the Company. (3) The Corporation to pay any difference between the purchase price of the scheduled land and that of any substituted site. (4) Also all the costs to which the Company had been put in reference to the recent scheduled

site; (5) and, further, the costs of obtaining parliamentary sanction to use the substituted site for gas-works purposes. (6) All furtheropposition to the Bill, of course, to be withdrawn. This, argued Counsel, showed how strong was the desire of the Directors to meet the Corporation. He declared that the proposed site was practically the only one in Margate that was suitable; being near a railway siding. This would be advantageous to the Company, whose object was to work the concern as economically as possible.

In reply to the Chairman, Mr. Fleetwood Pritchard said that the clause which had been put in the Bill for the protection of the petitioners had not been accepted by them. Mr. Balfour Browne remarked that if the petitioners opposing in the Lords were not dishonest, it was stupid, because the opposition ought to have been stopped. The clause which had been inserted gave the petitioners ample protection; and it was a fair clause, because it said the promoters were to carry out the works that the Engineer of the petitioners dictated, unless an arbitrator said they were unreasonable.

Evidence was then called in support of the Bill. The witnesses included Mr. William Curling, Chairman of the Company; Mr. H. E. Jones, who said that the Thanet Gas Company supplied the cheapest gas on the South Coast—viz., 2s. 6d. per 1000 cubic feet—that the proposed site was the only suitable one near the railway, and that there was no danger of polluting the Corporation water; Mr. Edmund H. Stevenson; Mr. Charles Hawksley; Mr. W. B. Bryan; and Mr. W. A. Valon, who stated that there was no doubt that with the skill of the Engineers who were acting for the Company, overlooked by the Engineers who were looking after it on behalf of the Corporation, a water-tight tank could be made on the proposed site.

For the petitioners, Mr. Freeman, in a very brief address, denied that the Corporation of Margate were taking a stand against the proper interests of the Company. They recognized that there should be an adequate supply of gas to the town; and that, if it could be so arranged as not to inflict an injury on the Corporation, they would not object to the Bill. But it was a most unfortunate and unusual thing that a Gas Company should select, out of all the country round, as the place to put their gas-works, a site immediately adjoining the water-works, if not absolutely over the adits, of the Corporation. It was necessary, in a seaside watering-place like Margate, not only that the water should be actually pure, but that it should be above any sort of suspicion. It was requisite to avoid even the possibility of inspiring misgivings in the minds of visitors; and he thought that visitors would not be likely to take a very cheerful view of the situation if they knew that the water of the Corporation came from beneath a spot on which there were large gas-works, with ammoniacal liquor and other residuals. There was, he maintained, an absolute danger that contamination would reach the water supply. The works would be on the chalk, in which there were many fissures, which would form direct channels from the gas-works to the water supply. If the Bill were carried, the Corporation would have to find another water supply.

Mr. Corbet Woodall was called and gave evidence in support of the petition. He said that he had been consulted as to this matter at the beginning of the year, and had had an opportunity of visiting Margate and examining the site of the proposed new works and the present works. The latter were capable of turning out twice the quantity of gas now demanded of them. The holders were sufficient for existing needs, and they could be further enlarged within the present tanks. There was no urgent necessity to go outside the present premises. The new site near the adit of the Corporation had disadvantages; and the danger apprehended by the petitioners was a real one. The subsoil of gas-works inevitably became foul, and sour, and bad; and percolation through the fissured chalk would be very likely to take place in course of time, and spoil the water. He was advised the chalk was largely fissured. As to the lighting power of the gas, he saw nothing unreasonable in the Company being asked to raise it to 15 candles. During the last three or four years, he had never advised a lower illuminating power than 15 candles. In cross-examination, witness said that part of the existing works might be reconstructed with advantage, so as to use machinery instead of hand labour. With the adoption of a more economical plan, 1½ million cubic feet of gas a day might be made instead of 750,000 feet. It was probable that the proposed tanks would be water-tight, but quite possible that they would not.

Mr. Baldwin Latham described lithea tests he had made in a variety of places, as demonstrating the ease with which water could be contaminated by surface impurities. He pointed out that the chalk was fissured on the site proposed for the new works; and that if the objects of the Bill were effected, there would be grave danger of pollution of the water supply. Mr. G. M. Macfarlane, a councillor of the borough of Margate, also gave evidence in support of the petition.

Counsel were then heard in summing up the evidence, and in reply; and the Committee having deliberated, the Chairman said they had decided that the preamble of the Bill was not proved. Asked by Counsel for the promoters if the Committee meant that the preamble was not proved at all, or that they had passed the Bill subject to the Company striking out part of it, the Chairman said they had decided that the Bill should not pass.

HOUSE OF LORDS COMMITTEE.

(*Before the Earl of* KINTORE, *Chairman, the Earl of* ROSSE, *Lord* ZOUCH OF HARYNGWORTH, *Lord* DE MAULEY, *and Lord* SOMERTON.)

FOLKESTONE CORPORATION WATER (TRANSFER) BILL.

This Bill, the object of which was to enable the Folkestone Corporation to purchase compulsorily the undertaking of the Folkestone Water Company, came before the above-named Committee on the 12th inst.

Counsel engaged were: For the promoters, Mr. Worsley Taylor, Q.C., Mr. Lewis Coward, Mr. T. Matthew, and Mr. Willis; for the Corporation of Dover, Mr. Freeman, Q.C., and Lord R. Cecil; for the Folkestone Water Company, Mr. Littler, Q.C., C.B., Mr. Balfour Browne, Q.C., and Mr. Ram; for the Elham District Council, Mr. P. F. D. Brockman; and for the Sandgate Urban District Council, Mr. R. C. Glen.

In opening the case for the promoters, Mr. Worsley Taylor stated that Folkestone was growing in public estimation and in population, the inhabitants now numbering 27,000. It was necessary, however, in dealing with the water supply, to consider the requirements, not only of the residents, but of the visitors, who in the season numbered, at one time, between 20,000 and 30,000. There could be no doubt that in such a place the water supply must be above suspicion, both as to quantity and quality. Even a doubt as to the nature and adequacy of the supply might cause a scare. Even if there were no special circumstances in this case, the promoters might rely with confidence on recent decisions of Parliament, and upon the general principles governing cases in which local governing bodies sought to acquire water undertakings. But in this instance, there were circumstances which justified the application to Parliament, even in a greater degree than in any previous case in which compulsory purchase had been authorized. The Water Company had a history which was without parallel in the United Kingdom. The population of Folkestone did not get what they bargained for—there was neither water enough, pressure enough, nor storage enough. By such a scheme as the present, a water famine might be avoided. The people had not received proper treatment. After the Bill of 1888, the Company had determined to punish those persons who had been prominent in endeavouring to bring them to a sense of their duty. This they had done by making stringent requirements as to water-fittings. In 1895, the Corporation had asked for equality of treatment as to supply, and for a reduction of antiquated and out-of-date charges; but the Company would not listen to a single demand. In 1895-6-7, representations had been made; but they had been thrown into the waste-paper basket. In cases of fire, the pressure on the mains had not been sufficient; but the representations which had been made on the subject had met with a similar fate. In short, there had been a general scarcity of water, not only for private purposes and for fires, but for *quasi* public purposes. The Company had been in existence fifty years, and had paid a progressive dividend of 9 per cent. They had had ample opportunity of doing their duty, but had not done it. They themselves had suffered in no way; and the promoters now said the time had come when the Company should be bought out on fair terms. The promoters maintained it was right that the undertaking should be transferred, and that the present was an opportune time for buying. The Company had a Bill which would come before the Committee later on, and in which they asked for new capital powers to the extent of £200,000, *plus* borrowing powers. In this measure the Company would be converting themselves into a new undertaking; and if their Lordships granted them the powers they sought, and the Company worked under these powers, they would be trebling their present capital. In other words, if the present promoters were to buy up the concern, as other corporations had bought up large undertakings, instead of having to take over a capital of £100,000 with a right on the part of the Company to earn a dividend on this amount, the Corporation would have an undertaking of three times the size imposed on them. Now therefore was the time to buy, if ever—when it could be done to the interest of the public, and without hardship to the Company. The Bill was justified by principle, precedent, and the special circumstances of the case. Dealing with the petitions against it, Counsel pointed out that the Dover Corporation did not oppose the proposed transfer, but held that the enlarged powers which would be conferred on the Water Company by the second Bill—and which would be taken over by the Folkestone Corporation if the present measure were passed—would be prejudicial to the Dover Corporation and their district. The Local District Boards objected to the promoters including parts of their districts in the limits of supply; and the Water Company simply objected to sell, denying that any adequate reason could be adduced for the proposal to wrest their property from them.

Evidence was then given in support of the Bill. The Mayor of Folkestone (Lieut.-Col. Penfold) declared that the population in the summer months was 50,000; and the water supply was not adequate for this number of people. At its source, the supply no doubt was pure; but storage did not improve the quality. The reservoir was an open one; and there were a great many weeds in it, which at certain seasons of the year decayed, and made the water of an unpleasant colour and taste. Medical men and the inhabitants petitioned against the supply; and resolutions had been passed at public meetings in favour of the proposal of the Corporation. From a sanitary point of view, it was essential that the water-works should be in the hands of the Corporation, and also for the purpose of extinguishing fires; there being an inadequate supply of water for the latter purpose at present. Witness also pointed out that the Corporation could raise money for the purpose of the Bill very cheaply—that was to say, at 2¾ per cent. In cross-examination on behalf of the Water Company, he admitted that at a public meeting called to give assent to the proposals of the Corporation, there had only been ten persons present. He also admitted that he was ignorant of the amount of money necessary to purchase the undertaking. He understood that the Company were taking measures to improve the water supply; and he had no complaint to make against them, except as to the inadequacy of the supply. He had not always been an advocate of the purchase of the water undertaking by the Corporation. It was not true that the second Bill would inflict injury upon Dover. The Dover Authorities thought it would; but nevertheless the promoters desired to have the works contemplated in that measure carried out. Mr. John Pearson, Sanitary Inspector of Folkestone, declared that the Company's reservoir only had a capacity of 1,300,000 gallons—or storage for nine days' supply—which was totally inadequate. He held that there should be a storage capacity of 75,000,000 gallons, or sufficient for 50 days' supply. No doubt, the water in itself was wholesome, when free from sediment; but at certain seasons it brought with it earthy and vegetable matter from the reservoir, and it was necessary to let the water run for some time from the tap before it was fit to drink. It was at night that the water was turned off in part of the area of supply. Dr. J. Bateman, Medical Officer of Heath for Folkestone, gave evidence to show that the present sources were insufficient to meet the growing needs of the consumers, especially in times of drought; and that they must in the very near future be supplemented. Dr. Tyson, as representing the medical profession practising in Folkestone and the neighbourhood, declared that he and his fellow practitioners were virtually unanimous in favour of the transfer of the undertaking to the Corporation, as proposed in the Bill. He considered that the present supply was inadequate to provide for the needs of the town. This closed the case for the promoters.

Mr. Glen then addressed the Committee in support of the petition of the Sandgate Urban District Council. He urged that in all Water Bills that had been passsed since 1855, Parliament had respected and safeguarded the rights of the District Councils, and had refused again and again to give either the Corporation of Folkestone or the Water Company powers over their areas, except with their free consent. But under the present Bill, the District Council would be deprived of any voice whatever in regard to the water supply of Sandgate; and the Corporation would be able to do what they liked in relation to the supply. Sandgate was a valuable rateable area; and the Corporation desired to obtain powers over it. If the Bill passed, they would be able in the future to urge the fact that they were the Water Authority as a reason why extended powers should be granted to them. When the Sandgate District Council were the Local Board, water-works were established; and though they had been handed over by agreement, they afforded a supply amply sufficient to meet the wants of Sandgate now and in the immediate future. In fact, when Folkestone suffered from drought, there was always a plentiful supply at the Sandgate works.

On the following day, Mr. Freeman, for the Corporation of Dover, said that he did not propose to offer evidence, as his clients were chiefly concerned with the next Bill, which most vitally affected the interests of Dover, because it proposed to take a new supply from an area which must absolutely tap the water on which Dover was dependent.

Mr. Balfour Browne, addressing the Committee on behalf of the Water Company, said the Corporation simply came forward now to take over the Company, because this was the time when they could buy most cheaply. He admitted that at one period the Company were not doing their duty. But now they had placed themselves unreservedly in the hands of one of the ablest water engineers in the country; and as the Corporation were not proposing further works, it was obvious that Mr. Hawksley's recommendations could not be carried out for at least a year or two, if the Corporation succeeded in their application to Parliament. The Corporation were taking advantage of the defects of the Company up to the last year, though the Company were doing the very best they could, according to Mr. Mansergh, to put themselves right. The Bill really meant confiscation, because the Company had not had time to recoup themselves for their expenditure.

Mr. Coward announced that an arrangement had been made with the Sandgate Urban District Council entitling them to purchase on arbitration terms, with the authority of Parliament or the Local Goverment Board, the portion of the undertaking within their district, or to be supplied in bulk from Folkestone.

The Committee postponed their decision on the Corporation Bill, and proceeded to deal with

THE FOLKESTONE WATER BILL.

The promoters (the Company), the Corporation of Dover, and the Sandgate Urban District Council were represented by the same Counsel as appeared for them on the Corporation Bill; Mr. Worsley Taylor, Q.C., Mr. Coward, and Mr. T. Mathew appeared for the Corporation of Folkestone; Mr. Freeman, Q.C., and Lord Robert Cecil, for the owners, lessees, and occupiers of mills and riparian proprietors on the River Dour; and Mr. Cunningham Glen, for Mr. Brockman, a landowner.

Mr. Balfour Browne shortly explained the object of the Bill. The Company started in 1848 with a share capital of £12,000 and a loan capital of £4000. The authorized capital was gradually increased, until to-day it stood at £100,000 share capital and £25,000 loan capital. Of this amount, £121,762 had been raised; and the balance was accounted for by overdrafts. The total water which they could now rely upon was 605,000 gallons per day; but the ordinary demand was 760,000 gallons. Including the summer season, the domestic supply averaged 29·7 gallons per head per day, and the trade supplies 4·7 gallons. The works proposed were two pumping-stations at Lydden and Drellingore, where wells were to be sunk 250 feet down through the chalk, each well being expected to yield about 1 million gallons daily; and a new service-tank, to hold 1 million gallons, which would be covered, and would give a high-service supply to all places in the town. It was proposed in future to furnish an absolutely constant supply. The Company expected to be in a position to do this by Jan. 1, 1901. The Company were empowered to base their charges on annual value. But they had only charged on rateable value; and they proposed to limit their powers to this mode.

Mr. George Spurgeon, Chairman of the Company, stated that if the powers now sought were given to the Company, they would decline to accept a clause prohibiting their consideration as enhancing the value in case of compulsory purchase. Mr. Charles Hawksley, M.Inst.C.E., said the proposed works would, if the wells were as successful as they hoped, yield sufficient to give a constant supply to Folkestone for the next 15 or 20 years. They had made arrangements with Lord Radnor for a temporary additional supply, to help them through the summer; and this, he hoped, would be available in about a fortnight's time. He admitted that the proposed works would affect the water flowing to the River Dour; but as the water proposed to be taken was not flowing in any defined and known channel, the Company would be entitled to take it. If there was such a channel—which he did not for a moment believe—the Company would come under the General Act, and would have to pay for it. The additional works were estimated to cost £137,800. In cross-examination, witness said he thought the apprehensions expressed on behalf of Dover were perfectly absurd. He did not believe the new works would affect the supply of Dover to the extent of a gallon a day. Dover would have no difficulty in getting additional water if needed; for between it and St. Margaret's Bay it was estimated that 10 million gallons a day were running out of the chalk into the sea. Mr. Brockman had been offered five times the value of his land. Mr. E. M. Eaton, Assoc.M.Inst.C.E., and Professor Rofe gave confirmatory evidence. The Earl of Radnor said he approved of the scheme. Professor Boyd Dawkins said he had made a special study of the chalk-bearing strata of England. He did not know of the existence of any defined channel in the chalk anywhere in this area. As to the fears of Dover, he shared Mr. Hawksley's views that they were simply absurd.

The first witness called for the opposition was Mr. Baldwin Latham, who said that the Dour and the Dover supplies would be diminished by every drop of water which was taken by the proposed works. There was very strong evidence of there being a stream running underground in a defined channel in this area—a channel so defined that when it was in flood, it flowed over the surface. This was proved by the rise and fall in the Nailbourne and in the wells. It would be easy for Folkestone to supply itself from the Elham Valley. Mr. H. E. Stilgoe, Borough Engineer of Dover, gave detailed evidence as to the wells in the district.

Among the witnesses called in support of the petition of Mr. Brockman, was Mr. Baldwin Latham, who spoke of the injury which would be done to his property if the Company's scheme were carried out; remarking that the extraction of the underground water would lead to the drying up of the wells in the neighbourhood.

Counsel for the Company, replying on the whole case, said that if the Bill were thrown out Folkestone would be confined for the present to the very limited supply of water obtainable under the agreement with Lord Radnor; and at least a year must elapse before a new Bill could be passed for securing a permanent water supply. It was therefore, he contended, certain that mischief would accrue to Folkestone if the Bill were rejected. The reply to the Dover petition was that the proposed new source of supply was 3¼ miles from the nearest wells which it was alleged the Company could injure, and more than that from the Dour. The Dover opposition, therefore, had no substance in it; and there was no ground to believe that Dover would be damaged at all, though it was certain that it would be of the greatest benefit to Folkestone if the Company's scheme passed.

In the result, the Committee decided that it was not expedient that the Folkestone Corporation Water (Transfer) Bill should proceed; and they found that the preamble of the Folkestone Water Bill was proved. The Chairman stated that, in this finding, the Committee were unanimous.

The clauses of the Company's Bill were then gone through; and the measure was ordered to be reported to the House.

FILEY WATER AND GAS BILL.

The promoters of this Bill—the Filey Urban District Council—asked for authority to supply water and gas in the district under their jurisdiction, and to acquire the undertaking of the Filey Water and Gas Company. The last-named Company petitioned against the Bill, which they said constituted an unjustifiable attack on their property, and would not conduce to the interests of the inhabitants and ratepayers.

Mr. Littler, Q.C., Mr. Fitzgerald, Q.C., and Mr. Lloyd were for the promoters; while Mr. Pember, Q.C., Mr. Worsley Taylor, Q.C., and Mr. Hans Hamilton represented the Filey Water and Gas Company.

Counsel for the promoters stated that, owing to its beautiful situation, Filey, which used to be merely a small fishing village, had become very popular as a seaside resort; and most of those who used to earn their living by fishing now found it more profitable to occupy themselves in taking summer visitors out in their boats. The winter population of 2500 was doubled in the summer months. The Company obtained their first supply of water from surface wells at a place called Hummanby; and in 1890 a further supply was secured by sinking a very deep well in Filey itself. The water from this well was good; but pumping only went on during the day, and no supply was available at night or on Sundays, except that from the surface wells at Hummanby. The Company were only bound to supply 10-candle gas, which was a power absolutely unknown in practice nowadays; it being difficult to make gas of so low a quality by modern improved processes. There was no limitation in the rate which the Company might charge; and the present price was 4s. 6d. per 1000 cubic feet. As long ago as 1885, the question of purchase was raised between the Company and the Local Authority. The Company had always been willing to sell; the only question being as to price. They seemed to be opposing the Bill because they had been advised that unless they did so they would be deprived of the allowance that was usually given for compulsory acquisition. In 1886, the Company offered to sell their undertaking to the Local Authority for £12,700; but, on a poll of the ratepayers being taken, the offer was refused by a narrow majority. In 1891, the Company obtained an increase of their capital. Last year the District Council approached the Company with a view to purchase. The Company stated that they were not willing to sell; and then the Council decided to promote the present Bill—this decision being confirmed by the ratepayers on a poll, by 509 votes to 60. On Jan. 31 last, a generous offer was made to the Company on behalf of the Council. The Company had been paying their maximum dividend for only two years; and the Council offered to give the shareholders annuities to the amount of the maximum dividends for twenty years, after which period the annuities were to be subject to redemption at 28 years' purchase. The Company at the same time were to retain their reserve fund; and the costs of winding up were to be borne by the Council. Since this offer was made, the Company had proceeded to issue further capital, on the ground that new works were necessary. Though they might have sold these new shares by auction at a large premium, they had distributed them at par among the shareholders; simply so that they might be able to claim a larger amount of compensation. The new capital thus created was £7000, which was probably double that which need be spent on any new works required. The Company had unexhausted borrowing powers, under which they might have borrowed at 3½ per cent.; but, instead of doing this, they had issued at par shares bearing interest at the rate of 7 per cent. Under the circumstances, Counsel thought it a most unjustifiable proceeding to have issued these shares, and especially to have issued them at par. The Council were still prepared to stand by their offer; but they were not willing to apply it to capital created since that time. In conclusion, Counsel said it was evident that the water of a pleasure resort like Filey should be above suspicion. It was not at present above suspicion; and the District Council wished to get the supply under their control, in order that they might perfect it.

The witnesses called for the promoters included Mr. N. Maley, the Chairman of the Filey Urban District Council, who denied that the town had been properly supplied with water, and said he thought it a perfectly reasonable proposal that, though the Company had been struggling for forty years without having paid the maximum dividend until the last two years, they should now be called on to sell. Mr. Smith, a member of the Council, stated that in January he was asked by one of the Directors of the Company to get the Council to make an offer for the purchase of the undertaking, so that it might be placed before the share-

holders. The result was the offer which had already been described. The desire to purchase among the people of Filey was exceedingly great. Other evidence of a similar character having been given, Mr. B. Blunt, chemist and analyst, stated that he had analyzed two samples of Filey water sent to him by Mr. W. Gofton, Clerk of the Urban District Council. One of these, labelled "Hunamby water," showed organic impurities, and was unfit for domestic use. The other, said to be from the deep well at Filey, though somewhat saline, was free from organic impurities, and suitable for drinking. Mr. Gofton said the two samples came from the same tap, which supplied several cottages in a yard in Murray Street, Filey. They were taken in March last; one when pumping from the deep well was going on, and the other when it was not. Mr. Edmund H. Stevenson, M.Inst.C.E., said he had visited Filey on the instructions of the District Council, for the purpose of the inquiry; but he had been refused admission both to the gas and water works. He had, however, seen the Hunamby works. He considered that the Hunamby water should never be supplied at all, unless it had been very thoroughly filtered. As it was not all filtered, he was not surprised at the evidence given by Mr. Blunt. There was what was called a filter at the works; but it was not more than sufficient to properly purify about 24,000 gallons per diem. There was no tank at all in which the filtered water could go; and therefore, when there was a draft on the main, unfiltered water would rush through. In cross-examination, witness said that the offer which the Council had made to the Company, if capitalized, amounted to £41,272, to which must be added the loan of £3000.

Counsel for the petitioners urged that it would be unfair to the Company to allow their undertaking to be compulsorily taken by the Council. The Company had had to contend with great difficulties; and now that they had surmounted them, and had entered on a prosperous career, the Local Authority, who had twice shirked purchase, were attempting to deprive them of the fruits of their efforts and their enterprise. Though the Company's standard illuminating value was only 10 candles, the present quality of the gas was 16 candles; and the charge was 3s. 9d. per 1000 cubic feet.

Mr. Tobey, Manager of the Company, stated that there were now very few complaints received respecting the gas supply; and the majority were due to defects in the pipes and fittings of the consumers. The price now charged for gas compared very favourably with the rates in other towns of a similar size, and under similar circumstances. Out of 105 towns, only 18 charged a lower price. The gas-works were situated at a great distance from any coalfields; and the cost of manufacture was therefore increased. During the past two years, the Company had been unable to keep up with the demand for gas. Last summer, the daily demand was 60,000 cubic feet; and the Company's storage capacity was only 35,000 cubic feet. The Directors had consequently agreed to devote a sum of money to the erection of gasholders, and that was why additional capital had lately been raised. Dr. Wheelhouse having given evidence against the purchase taking place at the present time, Mr. Corbet Woodall expressed the opinion that there was no justification for compulsory purchase, inasmuch as no fault could be reasonably found with the way in which the Company had performed their duty to the public. He thought that the offer made by the Council was too low.

In the result, the Committee decided in favour of the preamble of the Bill. They afterwards went through the clauses, and ordered the measure to be reported to the House.

HOUSE OF COMMONS COMMITTEE.

(*Before Sir* BEVAN EDWARDS, *Chairman*, *Mr.* CHANNING, *Mr.* DOXFORD, *Mr.* DOUGHTY; *Mr.* BONHAM-CARTER, *Referee.*)

RHYMNEY AND ABER VALLEYS GAS AND WATER BILL.

By this Bill, which came before the above-named Committee on April 28, the Rhymney and Aber Valleys Gas and Water Company sought to be incorporated, and to have powers conferred upon them for the construction of works, the supply of gas and water in the districts named, and the purchase of certain existing gas and water undertakings. The capital proposed by the Bill was £280,000, in 28,000 shares of £10 each; £200,000 to be called water capital and £80,000 gas capital, with borrowing powers to the extent of £70,000—three-fourths to be applied to water, and one-fourth to gas. The only petition against the Bill was that of the Merthyr Tydfil District Council, who objected on the ground that they, being the owners of an extensive system of water-works, constructed at great cost, were injuriously affected, as they were empowered by their Act of 1895 to supply, and had been supplying by agreement, part of the district in question—namely, Gelligaer—with water. The Council were at present constructing a new reservoir and enlarging their works; and they were desirous of continuing their supply in Gelligaer. There was no opposition to the gas portion of the Bill.

The case for the Company was conducted by Mr. Balfour Browne, Q.C., Mr. Claude Baggallay, Q.C., and Mr. Trevor Lewis; that for the petitioners, by Mr. J. D. Fitzgerald, Q.C., and Mr. J. Shaw.

On behalf of the Company, Mr. Balfour Browne contended that all the Local Authorities in the district, including that of Gelligaer, were not only supporting them, but were petitioning in favour of the Bill. The scheme was to supply the whole of the Rhymney and Aber Valleys with gas and water, and to buy up the undertakings of the existing small statutory local Companies—namely, the New Tredegar Gas and Water Company, the Rhymney Valley Gas and Water Company, and the Caerphilly Gaslight, Coke, and Water Company—who were not in a position to carry out so comprehensive a scheme as the promoters contemplated. The Bill did not in any way affect the Merthyr Tydfil District Council, whose limits of supply were outside the Company's area; and the Company were not seeking on their side to interfere with the Merthyr Tydfil district. There was, certainly, an agreement in existence between Merthyr Tydfil and Gelligaer (which latter district was the only one over which the Council could claim any rights of supply, all the other districts comprised in the area covered by the Bill being already served by existing undertakings), whereby the former agreed to supply for a minimum period of ten years from October, 1897, and the latter agreed to purchase, water as required. The Merthyr Tydfil District Council were under no statutory obligations to supply Gelligaer. The agreement in question applied only to surplus water after their own wants were satisfied; and, under the circumstances—Gelligaer being supporters of the Bill, and desirous of discontinuing taking their supply from Merthyr Tydfil as soon as the promoting Company were in a position to meet their demands—Counsel characterized the opposition of Merthyr Tydfil as the most monstrous piece of impertinence he had ever seen in a petition.

In support of the case for the promoters, a number of witnesses were called, the first of whom was Mr. Togarmah Rees, M.Inst.C.E., the Engineer to the Pontypridd Water Company. He said the Company proposed to construct two reservoirs holding respectively 46¼ and 45 million gallons. They would be in a position to filter 400,000 gallons a day, and serve a population of 40,000; the total available supply from existing and contemplated works being 670,000 gallons a day. The proposed catchment area was 800 acres; and the cost of new works was estimated at £82,000. He had had experience of reservoirs constructed on precisely similar soil to that of the proposed sites; and they were perfectly water-tight. He was satisfied that the catchment area would yield sufficient water. There was no possibility of pollution.

Mr. Rees was followed by Mr. G. H. Hill, M.Inst.C.E., who said he had examined the proposed sites for reservoirs, and agreed with the previous witness as to their suitability, from the point of view alike of situation and capacity. There was also a good site on the catchment area for an additional reservoir if required, in the case of an increase in the population. He also approved of the engineering details of the scheme, and was of opinion that a supply of 15 gallons per head per day would sufficiently meet the requirements of the district, if proper care were bestowed on the management of the works. He had not included trade consumption in his figure of 15 gallons, as he believed there was very little within the area. He based his figure on the Ystrad case, where it was proved that a supply of 12½ gallons per head daily was sufficient; and this district was similar in character to that of Ystrad. In cross-examination, he said he was aware that in Lancashire and Yorkshire most of the districts had a supply of 25 gallons per head. In the majority of cases in which he had been Water Engineer, he had recommended this quantity; but in some instances he had named 20 gallons. He thought, however, that in a mining district, with proper management of the works, 15 gallons would be ample.

The next witness was Mr. J. Jones, the Surveyor to the Gelligaer District Council, who said he considered it of the utmost importance that the water in all the districts concerned should be furnished by a body who were under statutory obligation to supply. Gelligaer supported the Bill, because, under their agreement with Merthyr Tydfil, they were only entitled to the latter's surplus water; whereas by the proposed scheme they would have a Company under statutory obligation to supply.

Mr. A. R. Cawley, the Manager of the Llanelly Gas Company; and Mr. Anthony, the Chairman of the Caerphilly District Council, gave evidence in favour of the scheme. Mr. G. J. Symons, F.R.S., furnished particulars as to the rainfall in the district; and Mr. W. Whitaker, F.R.S., testified to the suitability of the sites for the works.

The only witness called with reference to the gas portion of the Bill, was Mr. Edmund H. Stevenson, M.Inst.C.E., who said he had been over the district the Company proposed to serve. Many portions of it were inadequately lighted; and a good supply of gas was urgently required. There were four or five small Companies at present within the area; and he was of opinion that one head Company would be able to furnish a much better and more economical supply. Two of the existing Companies were non-statutory ones.

This closed the evidence for the Bill.

On behalf of the petitioners, Mr. Fitzgerald contended that the speech for the promoters was a mere travesty of the facts. Merthyr Tydfil had spent a large sum of money on its water-works. The District Council were in a position to meet all the immediate necessities of Gelligaer, and when their further reservoir, to hold 350 million gallons, was completed next year, they would be able to supply the whole of the district; whereas the promoters could not do so for five or six years. They were empowered by section 40 of their Act of 1895 to enter into agreements to supply with water District Councils and Local Authorities outside their limits. The moment this Bill passed, they would be deprived of those powers; and the Local Authorities would also be deprived of their powers, under the Public Health Act, to take water from Merthyr Tydfil. In these circumstances, if the preamble were passed, the Council would ask for the insertion of a clause in the Bill preserving their rights, under their Act of 1895, to supply, and the rights of the Local Authorities to take, their water, if desired.

In support of the case for the petitioners, Mr. G. F. Deacon, M.Inst.C.E., said there were an enormous number of swallow-holes in the proposed catchment area. He had gauged the streams, and found that nearly five-sixths of the water that passed down them disappeared into the rock. The site was a bad one for the construction of reservoirs; and if £82,000 were spent upon them, even supposing the maximum charge to the consumers were made for the water, he did not see any possibility of a remunerative return. Merthyr Tydfil could supply the whole of the district in question. Mr. T. Harvey, Assoc.M.Inst.C.E., the Resident Engineer of the Merthyr Tydfil District Council, agreed with the evidence of the last witness. Mr. T. H. Dowdeswell, the Chairman of the Caerphilly District Council, Mr. A. Phillips, a member of the Glamorganshire County Council, and Mr. J. Aurelius, of the Gelligaer District Council, opposed the scheme. If the Bill passed, they wished to have their rights to take water from Merthyr preserved.

Mr. Claude Baggallay, in replying for the promoters, said the opposition of Merthyr Tydfil showed a complete change of front. He had thought the object of the petition was to ask Parliament to throw out the Bill, in the interests of the persons whom it was intended to supply with water; but it now appeared that the sole motive of the petitioners was to protect the market for the sale of their surplus water. It was true that the promoting Company had brought before Parliament last year a Bill which was opposed by three Urban Authorities in the district, and rejected. This stumbling-block had since been removed, and they now appeared with the consent of all the previous opposing parties. He was prepared to make the following offer to Merthyr, preserving their rights: "That so long as Merthyr Tydfil and Gelligaer choose respectively to sell and to buy water under their existing agreement, the promoting Company undertake not to supply in the parts of Gelligaer so served." This saving clause would

protect Merthyr, but, of course, would not apply if the ten years' existing agreement between Merthyr and Gelligaer was determined.

In the result, the Committee passed the preamble of the Bill, and adopted the saving clause offered by the promoters. They further thought that the following clause, which was frequently put into Water Bills, should be inserted: "If, after the expiration of five years from the completion of the works, any local authority is unsupplied, the restriction contained in section 52 of the Public Health Act shall not be enforced."

The Committee subsequently presented a report in the course of which they said: "The object of the Bill is to incorporate a Company and confer powers on them for the construction of works for the supply of gas and water, and the purchase of certain gas and water undertakings, and for other purposes. A report from the Local Government Board was laid before the Committee, and considered by them, and they have made provision in the Bill to give effect to the recommendations contained in that report so far as seemed desirable to the Committee. With regard to that part of the report which referred to the importance of preserving the sources of water supply from pollution, the Committee fully considered the same, and were of opinion that, pending the settlement of clauses for general application for insertion in all Water Bills of the present session, and in order to secure uniformity of treatment, the Committee had deemed it desirable to leave the Bill as it stands for the present, with a view to the insertion of a general clause at a later stage of the Bill. But it was proved to the Committee that the proposed reservoirs were situated on very high ground in a mountainous district, and at a distance from any population; and that therefore it was hardly possible that any such pollution from the surface could take place as referred to in the report."

HOUSE OF COMMONS COMMITTEE.

(*Before Sir* H. Fletcher, *Chairman, Sir* H. Bullard, *Mr.* J. W. Logan, *and Mr.* C. Morley.)

SOUTHAMPTON GAS BILL.

By this Bill, which came before the above-named Committee on the 13th inst., the Southampton Gas Company sought to extend their limits of supply, acquire additional land for the enlargement of their works, consolidate their stock, and raise further capital. The Company was formed in 1848; and by the Act then obtained they raised capital to the amount of £50,000, in £50 shares, entitled to a maximum dividend of 10 per cent., and had borrowing powers to the extent of one-third, or £16,666. Under the terms of an Act obtained in 1865, they raised an additional £60,000 of capital, in £25 shares, with a maximum dividend of 7 per cent., and £15,000 by debentures. By the same Act they were authorized to capitalize a sum of £20,000 which had been spent out of revenue on the works. In 1876, power to raise further capital to the extent of £100,000, in £25 shares, entitled to a 7 per cent. maximum dividend, and £25,000 by debentures, was granted to them. In this case, the auction clauses were applied for the first time. Under the operation of these clauses, a premium of £38,458 on the ordinary shares, as well as one of £10,859 10s. on the debentures, was secured. The total capital of the Company already raised is £230,000 by ordinary shares, and £56,666 on debentures. It was now proposed to consolidate the stock, and, in place of the ordinary shares carrying different dividends, to issue £344,000 of fully-paid stock bearing a uniform maximum dividend of 5 per cent. Besides this, the debenture stock would be converted into stock of the value of £70,825, bearing 4 per cent. interest. In addition to the consolidation of the stock, the Company propose to provide new capital to the amount of £200,000 by the issue of ordinary shares, and £50,000 on debentures, for the extension and improvement of the works. There were two petitions against the Bill—one from the Eastleigh and the other from the Hursley Urban District Council. In their petition, the former Council contended that the consolidation of the stock and the raising of the additional capital proposed would operate injuriously to the consumers. They objected to the maximum price of gas as fixed in the Bill, and suggested that the sliding-scale should be inserted. They also complained that the illuminating power of the gas was deficient, and suggested that the pressure should be increased.

Mr. Pember, Q.C., Mr. G. A. R. Fitzgerald, and Mr. G. J. Talbot appeared for the promoters; and Mr. Reader Harris, Q.C., for the District Council of Eastleigh. The Hursley Council were not represented.

In opening the case for the Company, Mr. Pember explained the scheme for the consolidation and increase of the stock, and the proposed extension of the limits. The maximum price in the Bill was 3s. 6d. per 1000 cubic feet within, and 4s. 6d. outside the borough. The limits of the county borough had been considerably enlarged; but the Company intended to do away with the present difference in charge within the next ten years, and make the price the same within the whole of the extended area. With regard to quality, they proposed that the gas should not contain more than 22 grains of sulphur in winter and 20 grains in summer, and that it should have an illuminating power of 15 sperm candles. They had continually reduced the price during the last twenty years, without any sliding scale. Turning to the petition of Eastleigh, the learned Counsel said the entire consumption of the place, including that of the South-Western Railway Company, was only 1-16th of the whole; and deducting the Railway Company, the private consumption was only 1-45th. And yet the Council had objected, and asked that a sliding-scale clause shou'd be introduced.

Mr. Reader Harris remarked that he did not intend to trouble the Committee on the subject of either the sliding-scale or the illuminating power of the gas. He did not object to the proposed extension of the limits of supply. The Council's opposition would be limited to the question of the reserve fund, the price of the gas to Eastleigh, and the pressure.

Mr. Pember said the Company were allowed by law to set aside as a reserve fund 10 per cent. of the nominal capital, so that the only increase would be £11,000. After further criticizing the objections in the petition, the learned Counsel called evidence for the promoters.

Mr. C. Crowther Smith, for 32 years Secretary of the Company, gave details in regard to their capital and the proposals for its consolidation. He said the present maximum prices of gas were 4s. 6d., 5s., and 5s. 6d.; but by the Bill they were decreasing them to 3s. 6d. and 4s. 6d. These were the statutory maximum figures; but the charge now was from 2s. 6d. to 3s. The net cost for the manufacture and distribution of gas in 1876 was 2s. 6·55d. per 1000 cubic feet; while in 1897 it was 1s. 10·90d.—a reduction of 7·65d. The total profit in 1876 was £15,641; and in 1897, £16,977. In the whole area the price in 1876 was 4s. 6·58d.; and in 1897, 2s. 8·76d. In cross-examination by Mr. Reader Harris, witness said he knew that the population of Eastleigh had lately rapidly increased. The mains from the gas-works to Eastleigh were about 6 miles in length. The statutory maximum price for that town was 5s.; but the actual charge was only 3s. For seven years, except in 1894, they had not made enough profit to pay the maximum dividend on their stocks. In answer to questions put by Mr. Fitzgerald, witness said it was quite a general practice to charge on a higher scale for gas supplied to districts distant from the works. He had a list of 39 local authorities who did so, some of whom made a difference of 1s. 8d. to 2s. per 1000 cubic feet in the rates. They had had no complaints from any of the neighbouring local authorities, or from any private consumers.

Mr. Corbet Woodall was the next witness called. He said that he was acquainted with the Southampton Gas-Works; and, speaking generally, the undertaking was a well-managed one. If Eastleigh had works of its own, it would not be able to supply gas at the price now charged them by the Southampton Gas Company. The Company needed more space, and all the additional capital they sought. If the business grew at the same rate as now, it would be doubled in 14 years. In answer to a question by the Chairman, witness said there was no gasholder at Eastleigh; the gas was sent direct from the works. Replying to Sir Harry Bullard, Mr. Woodall said he considered an illuminating power of 15 candles a very good one. No higher figure could be reached with ordinary coal; and the gas would have to be enriched either by cannel or oil.

Mr. Edmund H. Stevenson said that, in his experience, it was a common practice to charge more for gas outside a Company's district; and there were no special circumstances in the case of Eastleigh. There were only about 150 consumers; and this was what a Company had to consider. The increase of the reserve fund by £11,000 he did not consider an unreasonable proposal, This point was fought out strongly in the case of Bristol, which was one of the first cases of the consolidation of capital by a Gas Company.

Counsel here stated that Mr. Cash was in attendance; but, unless the Committee wished it, he would not call any further evidence. The Chairman said it was not necessary, unless there were any new points to bring forward.

Mr. Reader Harris then proceeded to call witnesses for the petitioners; the first being Mr. Henry White, the Clerk to the Eastleigh Urban District Council. He said the population had rapidly increased, from 1017 in 1881, to 3552 in 1891, and 7500 at the present time; while the rateable value, which was £28,874 in 1893, was now £38,278. The South-Western Railway Company had lately removed their carriage works to the place; and there was a prospect of the locomotive works following. The district had lately been enlarged in the direction of Southampton; so that their southern boundary was only 1½ miles from the borough boundary. They did not object to the present price of gas—3s. per 1000 cubic feet—but they did not like the increased statutory maximum. They felt strongly that they should be treated like the additional area which had been joined to the borough. The Council were unanimous in that view.

The inquiry was then adjourned till the following Tuesday, when the case of the Eastleigh District Council was continued.

Mr. White, further examined, said they objected to pay more for their gas than the Company charged within the extended area. Their contention was that, being so close to the borough, they were entitled to the terms accorded to the extension.

Mr. W. A. Valon said he was very well acquainted with Southampton and with the gas-works. The area of supply was large. Eastleigh was an urban district which was rapidly extending. There were about 1800 houses in the town; and the Council felt that if they were not now put upon the same terms as the added area, it would be some years before they would be enabled to ask Parliament to consider their case. At Southampton the Gas Company had the competition of the electric light; and they were afraid the Company might be tempted to reduce the price within the borough, and make up the loss by an increased charge to the outside consumers. At Eastleigh there was a consumption of 24 million cubic feet of gas per annum; and any Company would be glad to lay mains to supply such a quantity. The cost of the production of gas at Southampton—1s. 11d. per 1000 cubic feet—was high; and the capital expenditure had, in his view, been excessive. It was £670 per million cubic feet; whereas the parliamentary limit was £500, and the average generally about £380. They objected to the reserve fund being augmented by £11,000. The works had not improved in value, there was no additional risk, and the reserve fund had been raised simply by a nominal increase of the capital.

Mr. Reader Harris then addressed the Committee; and, after a short reply from Mr. Fitzgerald, the Chairman stated that they found the preamble of the Bill proved. But they desired the insertion of a clause limiting the maximum price of gas at Eastleigh to 3s. 6d. per 1000 cubic feet, in place of 4s. 6d. named in the Bill. This clause was added; and the Bill, as amended, was ordered to be reported.

Two Deaths by Coal Gas Poisoning at Preston.—On Sunday week two sailors—William Peterson, aged 46, a Norwegian, and Maurice Larson, aged 24, a Dane—were found dead in bed at their lodgings at the Steamer Hotel, Preston. The two men arrived on the 7th inst. from South America, and went to the hotel, where they shared a room and a bed. They drank heavily during the week; and on the following Saturday night, when they retired about eleven o'clock, they were both under the influence of liquor. The following morning the landlady detected a strong odour of gas; and on her husband going to the sailors' bedroom he found it full of gas, which was escaping from a jet turned on full. He opened the window, and spoke to the men about the matter; but though they appeared conscious, they gave no explanation. Three hours later they were both found to be sleeping heavily; but when the landlady went to the room at five o'clock they were dead. An inquiry into the matter was held on the following day, and a verdict of "Accidental death" returned by the Jury.

LEGAL INTELLIGENCE.

The Gaslight and Coke Company Fined for Deficient Illuminating Power.

At the Clerkenwell Police Court last Tuesday, The Gaslight and Coke Company were summoned, at the instance of the London County Council, for supplying, on the 3rd of January, at the testing-place, Vincent Terrace, Islington, gas of deficient illuminating power. The Company admitted the offence; and a fine of 40s. and costs was imposed.

The Strike at the Llanelly Gas-Works.

At the Llanelly Police Court last Wednesday, the charge-sheet contained the names of nine employees at the gas-works who were summoned, under the Conspiracy and Protection of Property Act, for leaving their work under circumstances recorded in the last and present issues of the "JOURNAL." Mr. Howell, on behalf of the prosecution, said the accused men had come out on strike, which might have meant that the town would be in utter darkness. Now, however, the men had returned to work; and therefore the Gas Company did not wish to proceed with the cases. He asked for the consent of the Bench to the withdrawal of the summonses. This was given; a hope being expressed that the trouble would not occur again. Arising out of the strike were two other cases—one of alleged intimidation, which was adjourned; and the other, a case in which William Morris was fined 20s. and costs for trespassing upon the gas-works, and assaulting Edward Morris, a lamp-fitter in the Company's service.

The Basis of Assessment for Water-Rates at Eastbourne.

A dispute between the Eastbourne Water Company and some of their customers was investigated at the Hailsham Police Court last Wednesday. The rates in question had been calculated on the annual rack-rent or value of premises; and certain householders contended that deductions should be made. In pursuance of the Company's Acts, the matter had to be determined by two Justices; and it was arranged that the cases should be heard at Hailsham. Defendants were A. J. Phillips, C. D. Sherrard, T. Cosnight, W. Smith, Alice E. Dyer, and P. E. Luck; and it was decided to first hear the case against Mr. Cosnight. Mr. Danckwerts appeared for the Company; and defendant was represented by Mr. Lawson Lewis. Mr. Danckwerts, in opening the case, said that the Magistrates' task was a very easy one, because there was an express decision in the High Court which determined the basis on which the assessment was to be made. Under the Company's Act of 1859, the rates were to be paid on the annual rack-rent or value of the premises supplied; and what he now applied to the Justices to decide was the annual rack-rent or value of these particular premises. In support of his contention, he quoted the cases of *Stevens v. The Barnet Water Company* and *Dobbs v. The Grand Junction Water Company*, and pointed out that the Courts had held that the annual value was the same as the annual rack-rent—viz., the amount at which the premises might be reasonably let, the tenant paying rates, and the owner being responsible for repairs. He contended that the annual rack-rental and the annual value were identical. Two valuers were called, and both placed the annual rack-rent of Mr. Cosnight's premises at £82. In addressing the Bench, Mr. Lawson Lewis said he ventured to think the question to be decided presented some features of difficulty. Mr. Danckwerts had referred to only one case; and for a very good reason—it was the one solitary judgment in his favour. The Magistrates were in no sense bound by the judgment in *Stevens v. The Barnet Water Company*, as the principle had been considered and decided in a still later case. Most Water Companies had a Local Act; but there was also the General Act of 1847, which applied in the absence of a Local Act. Mr. Danckwerts said it only applied to the extent to which it was incorporated in the Local Act. Mr. Lewis held that it applied where it was incorporated, and where it was not inconsistent with the Local Act. The General Act provided that the charge should be calculated upon the annual value. In the Public Health Act of 1875, section 56, there was something approaching a definition of the expression "annual value," in the provision that where a local authority supplied water to any premises they might charge in respect of such supply a water-rate to be assessed on the net annual value of the premises ascertained in the same manner by this Act prescribed with regard to the General District Act. That was the statutory definition. Mr. Danckwerts challenged Mr. Lewis to show him any word that the Company should charge, not in accordance with the Special Act, but in accordance with the Public Health Act. Mr. Lewis said he read the section for the purpose of showing how the Legislature had defined "annual value." It was that the word "net" must be read in before annual value. Mr. Danckwerts was prepared to admit that the words "annual value" by themselves would mean the net annual value; but where they were used in conjunction with annual rack-rent they did not mean it. Mr. Lawson Lewis said the Judges had held that rack-rent value and annual value were one and the same thing. This being so they had to decide first what was rack-rent, for which he relied on section 4 of the Public Health Act. After deliberating in private, the Chairman (Mr. G. W. Osborn) announced that the Bench considered that the principle laid down in the case of *Stevens v. The Barnet Water Company* must govern the present case. The words of the Eastbourne Act "annual rack-rent and value" being so like those of the Barnet Act should, in their opinion, receive the same practical construction. Under the circumstances, Mr. Lewis said he should have to submit to an assessment of £82 in this case; but he must ask for the other cases to be adjourned *sine die*. Mr. Danckwerts gave an undertaking that, in the event of the matter being taken to a Higher Court, and the decision of the Justices being ultimately reversed, the Company would return whatever difference there might be in the amount to be paid. It was ultimately arranged that the assessments made by the Company should be agreed to by all the defendants, except Dr. Sherrard, who said his dispute had reference to the quality of the water. The summons against Dr. Sherrard was accordingly dismissed with costs, and the other cases were adjourned *sine die*.

MISCELLANEOUS NEWS.

THE REPORT OF THE BIRMINGHAM CORPORATION GAS COMMITTEE.

Allocation of the Profits; Reduction in Price.

The annual report of the Gas Committee of the Bir mingham Corporation, which was noticed in last Tuesday's issue, was considered at a special meeting of the Council that day. On its presentation,

Alderman POLLACK first moved that the Committee should be authorized to appropriate £50,336, being the net profit of the department for the year ended March 31 last, as follows: £19,749 (the balance of £30,000 promised) to the credit of the improvement rate of 1897, and £30,587 to the credit of the improvement rate of 1898. He said the result of the last year's financial trading of the department showed a surplus of £50,336 as compared with a surplus of £35,250 in the preceding year—an addition of £15,086. This was due in the first place to an increase of 215½ million cubic feet in the output of gas; being 4 per cent. over the phenomenal increase of 12 per cent. in the preceding year. In the year ended March, 1894, the gas sold and used on the works was 3989 million cubic feet; whereas last year the amount was 5074 millions—showing an increase in four years of 1085 million cubic feet, or 25 per cent. He trusted the Council would be of opinion that such an increase justified them in allowing the Committee to proceed with the additional works they proposed to erect in order to provide for the growing demand. The second cause why this additional profit had been made was that the increase in the expenditure under the head of manufacture last year had been very small; while there had also been a saving in repairs, maintenance, and establishment and law charges. Putting the latter item against the former, the net increased expenditure under the head of manufacture was only £3386. For this additional outlay in manufacture, they had an increased revenue from the sale of gas and a few smaller items of £23,280. From this had to be deducted a further decrease of £3851 in the receipts from residuals; leaving a net additional revenue of £19,429, gained by an increased expenditure of £3386. This result was shown notwithstanding that coal was somewhat dearer, and that the concessions made to the workpeople were equivalent to a charge of something like £9000 a year. The explanation was that, by duplicating the water-gas plant, they had been able to produce 472 million cubic feet of gas from this source at a time when oil was cheaper; while, further, the growing use of gas for motive power had vastly increased the output during the day-time, and so tended to equalize the general expenses all the year round. Had it not been for the shrinkage in the receipts from residuals, their surplus would have been very much larger. If the residual products had commanded the same price as in 1890-91, the surplus this year would have been more than doubled. He did not think residuals were likely to materially decrease further; but, on the contrary, he hoped to see them increase somewhat next year. The balance of the revenue account, after providing fully for depreciation and other contingencies, was £132,332, which was equal to 6¾ per cent. on the capital employed of £2,213,531. To those who were accustomed to receive dividends of 20, 50, or even 100 per cent. on cycle, tube, or gold-mining shares this result might not appear to be a large percentage of profits; but it might interest the Council to know that, had the gas undertaking still belonged to a Company, the market value of such capital, divided into debentures, preference, and ordinary shares, would be between 4 and 5 million pounds—almost enough to pay half the debt of the Corporation. It had hitherto been the practice to pay over the profit of the department to the Finance Committee to the credit of the improvement rate of the past year; the Gas Committee making an announcement at the beginning of the year that they expected to pay so much towards the rate. Although these promises had always been kept, yet it was a method which he must call irregular; and the Committee now seized the first opportunity of altering it. Last year they not only paid over the amount they had promised in respect to the year preceding; but they obtained the authority of the Council to pay in advance a sum of £10,250 to the credit of the improvement rate of 1897. They now proposed to add to this sum £19,750, completing the £30,000 promised to the 1897 rate. But the large profits now reported enabled them to pay in advance their contribution to the improvement rate of 1898-99, as set out in the resolution. It would henceforth be unnecessary to make any promises; but the Finance Committee, in considering the rate, would have the gas profit actually within their reach, and thus be able to save £1000 interest.

Alderman KENRICK, M.P., seconded the motion, which was carried.

Alderman POLLACK next proposed that authority be given for increasing the salary of Mr. Morrison, the Superintendent at Saltley, from £425 to £475 per annum, subject to payment by him of house-rent. He considered that Mr. Morrison richly deserved the proposed increase. He had been in the employ of the Corporation since 1879—filling the positions of Clerk of Works and Analyst, and during the last ten years that of Superintendent of the Saltley works. The members of the Committee were of opinion that he fulfilled the duties of the post with increasing efficiency.

The resolution was carried.

Alderman POLLACK then moved that the Committee be authorized to carry out their recommendation of a reduction in the scale of gas charges. The present prices, he said, were adopted in 1886; the rise in 1893-4, owing to the coal strike, being only a temporary one. The existing scale was: To consumers of under 25,000 cubic feet per quarter, 2s. 7d. per 1000 cubic feet; over 25,000 feet and under 50,000 feet, 2s. 5d.; above 50,000 feet, 2s. 3d., subject to 5 per cent. discount. The large increase in the consumption of gas had imposed a duty upon the Committee to examine whether they could not revise the prices charged, and that in such a manner as to consolidate the best interests of the undertaking, while giving relief where it was most wanted. During many years it was the proud boast of the Committee that the prices charged for gas were, all circumstances considered, the lowest charged by any Corporation or Company. They could hardly say that now, however; and the gas consumers of Birmingham would be somewhat justified in appealing to the Council for a revision of prices. The Committee, therefore, had come to the conclusion that the time had arrived when they could conscientiously recommend a reduction of prices, involving a sacrifice of profits of from £26,000 to £30,000. In considering the best and most just method of

applying this sum, the Committee remember that, in addition to the special price charged for public lighting, they had three scales. They would have liked to reduce these to two; but the amount at disposal was not sufficient to effect at present so radical a change. A penny per 1000 cubic feet on the present large output of gas—upwards of 5000 million cubic feet—meant £21,300; and a reduction of 2d. all round was therefore impossible. The Committee consequently recommended the maintenance of the present three scales; and the application to each of a reduction of 1d. The future charges for gas, then, would be 2s. 6d., 2s. 4d., and 2s. 2d., all subject to 5 per cent. discount, which would make them net 2s. 4⅜d., 2s. 1⅛d., and 2s. 0⅞d. This would constitute a very satisfactory reduction; but the Committee also decided to make some further concession in the direction where it would be most beneficial to the best interests of the gas undertaking, and indirectly to the smaller gas consumer, by maintaining and increasing the present large consumption of gas, which alone enabled them to recommend the present reductions. The most profitable class of consumers were those who paid the lowest price. Their number was but one-tenth of those who paid the highest scale; but their average annual consumption of gas per consumer was eighteen times as much—the quantity of gas supplied to those who paid 2s. 3d. being 2719 million cubic feet, as against 1465 millions supplied to the consumers who paid 2s. 7d. The comparative growth of consumption of the three scales established in 1887 was remarkable. In 1887 the consumers who paid 2s. 7d. used 1192 million cubic feet, and now 1465 millions—the growth in the eleven years being 23 per cent. The consumers who paid 2s. 5d. used in 1887 483 millions; and now, 606 millions—the growth in the eleven years being 25½ per cent. The consumers who paid 2s. 3d. used in 1887 1512 million cubic feet, and now 2720 millions; the growth in the eleven years being 80 per cent. It was therefore, to this class of consumers that the growth of the gas undertaking was principally due. They had already an advantage in price; but the difference was fully warranted by the average charges for meters, meter reading, leakage, and general administration expenses, which were nearly the same whether a consumer burned 2000 or 200,000 cubic feet per quarter. Another reason which weighed with the Committee was the fact that, since the expiration of the master patents, the advantages of cheaper gas-engines were more and more recognized; and there could hardly be a doubt that in Birmingham the gas-engine would to a great extent take the place of steam. Their old competitor the gas-producer was fully alive to the opportunity of coming in where gas was too dear. It had already damaged them; for they lost last year the sale of 40 million cubic feet of gas through its introduction. The intention of the Committee was to deprive it of further chances; and they thought they could do so by a reasonable reduction of price, the loss entailed by which would soon be recouped by increased consumption. The question of making a special price for gas used for motive or heating power or for day consumption had often been considered. But they did not think it reasonable that a client who used gas for brazing, heating, or lighting purposes should be in a worse position than the user of gas-engines; and their recommendation was not to disturb the present three scales, which would all benefit by the reduction of 1d., but to establish an additional scale for consumers of no less than 250,000 cubic feet per quarter, and to fix it at 2s. per 1000 feet. This reduction would affect about one-fifth of their total output—that was to say, about 1000 million cubic feet, and would be equivalent to a loss of revenue of about £10,000. Such a loss, however, would be gradually incurred if this class of customers left the Committee; and, on the other hand, by making the proposed concession, such loss would soon be recouped, and the undertaking placed in an unassailable position. The Committee wanted to make sure of retaining and increasing the number of their most profitable gas consumers; and having secured them, they hoped at no distant time to be able to make further reductions in the higher-priced scales. No fear need be apprehended respecting their contributions to the rates. The Committee looked upon it in the same light as the payment of the annuities or debt they had to discharge; but the possibility of the continued payment of the contribution would be immensely strengthened by the adoption of the resolution.

Alderman Dr. BARRATT seconded the resolution.

Mr. LANCASTER pointed out that in 1886, when the charge for gas was increased, the Council were told that it was because the price of residuals had decreased. In that year 350,000 tons of coal were carbonized; and the residuals produced £83,864. Last year more than 500,000 tons of coal were carbonized, and the residuals only produced £96,819; whereas if the proportion had been the same as in 1886, the amount would have been £126,000. The residuals had been going down in price for several years; and, therefore, he did not think this was an opportune time for reducing the price of gas. He did not believe the reduction of the price to 2s. would increase the consumption of gas by large gas-engine users. Gas for heating purposes might be made very much cheaper—8d. or 9d. per 1000 cubic feet; and if they endeavoured to compete with people who made their own gas, he thought their profits would diminish.

Mr. LANE objected to the reduction in prices proposed by the Committee, urging that the present charges were moderate, and compared favourably with those of other Municipalities. If there was to be a reduction, it should apply to the prepayment meters used by the poor people. He moved as an amendment that, having regard to the uncertain and fluctuating nature of the surplus profits of the Gas Committee annually placed to the credit of the municipal income, it was undesirable to further reduce the price of a commodity which was manufactured at the risk of the ratepayers of Birmingham, and sold to outside consumers who had no capital or responsibility involved.

Mr. KELLY seconded the amendment; but the LORD MAYOR declined to accept it on the ground that it was a direct negative.

Mr. BISHOP said it was quite true that gas for heating purposes might be produced at 9d. or 1s. per 1000 cubic feet. But he understood that it required three times as much of that gas to do the same work; and therefore the cost would, after all, be pretty much the same.

After further discussion, the proposal was carried by 52 votes to 6; and the report was also subsequently adopted.

Huddersfield Corporation Gas Supply.—Though there was 2 per cent. less gas made by the Huddersfield Corporation in the past financial year than in the preceding twelve months, the profits were £9037, as compared with £8340—an increase of £697.

WARRINGTON CORPORATION GAS SUPPLY.

Additional Capital for Slot and Ordinary Meters.

At the Town Hall, Warrington, last Wednesday, Mr. W. O. E. Meade-King, M.Inst.C.E., held an inquiry in regard to an application made by the Corporation for authority to borrow £10,000 for the purchase of slot and other gas-meters. The Town Clerk (Mr. J. L. Whittle) stated that the amount asked for was wanted for not more than 15 years. The Corporation, who purchased the gas-works in 1877, had already spent out of revenue £6600 for slot meters; but this was not included in the £10,000. The Gas Committee had been taken to task for spending their revenue in this lavish manner; as the Chairman of the Finance Committee thought he was entitled to it for reducing the rates. Their Gas Engineer (Mr. W. S. Haddock) estimated that in ten years he would require 5000 meters at £2 each. This year he would need 1000. They found the prepayment meter an exceedingly popular method of supplying poor people with gas. They had at the present time on their books no fewer than 100 applications for these meters. The Corporation had not previously borrowed money for the purchase of meters of this kind; but they had obtained £20,000 for extensions. The Corporation wished to take up the loan as it was required. Mr. Haddock stated, in answer to questions put by the Inspector, that the annual consumption of gas was 216 million cubic feet by ordinary meters, and 20½ millions by slot meters. The works were capable of turning out a million cubic feet of gas per day, or rather more. At the present time there were 3200 slot meters in use; and the Corporation fixed them, and gave 25 cubic feet of gas for 1d., or seven hours' consumption, for one light. The Corporation had a five years' guarantee with each meter. They did not exchange the ordinary meters for slot meters, otherwise the demand would be greatly increased. They began the slot system in 1896. These meters were supplied to people of the artisan class almost exclusively; and they were found to be of great advantage to them. Alderman Sutton asked if any calculation had been made as to the profits realized by the slot meters. Mr. Haddock replied that it had, and was satisfactory. The Town Clerk remarked that the Corporation thought less profit was obtained from these meters than from the ordinary ones; but they encouraged people to use gas.

The Inspector then proceeded to deal with other matters concerned in the inquiry.

BOLTON CORPORATION GAS SUPPLY.

A Large Profit-Earning Department—£26,000 in Aid of Rates.

At a Special Meeting of the Bolton Town Council last Thursday, Alderman Miles, as Chairman of the Gas Committee, delivered an address on the working of his department during the past financial year. In the course of his remarks on the balance-sheet, a summary of which appeared in the "JOURNAL" last week (p. 1147), he said that some of the figures were, in his opinion, extraordinary. There had been spent £11,879 on capital account, which was a tolerably large sum for one year. On the other hand, he was pleased to say they had depreciated the account out of revenue by £5000. The Gas Committee had shown considerable energy in cheapening production; and their efforts had been successful. Though they had had a remarkably light and mild winter, they manufactured 3 million cubic feet more gas than in the previous year. This astonished him; and a further remarkable fact was that they had done this at a reduced cost for coal and cannel—the difference under this head for the two periods being £2471. He assured the Council that this had been accomplished without any sacrifice on the score of quality—in fact, the official report showed that the gas produced last year was 0·25 candle better than the average of the preceding twelve months. This striking result was due to the fact that they had been able to use less cannel—slightly under 5 per cent., against 8 or 9 per cent.—and to the excellent results which had followed the introduction of mechanical stokers. In spite of the fact that they had received considerably less from the sale of residuals—tar alone showing a falling off of £2406 as compared with the previous twelve months—it was in their power to hand over £26,000 in relief of the rates. This was equal to a rate of 1s. 3d. in the pound. He was afraid, however, that in doing so they had reached the high-water mark. He went on to say that they had now 1855 gas-cooking stoves in use, 775 gas-fires, and 5200 small grillers. He concluded by paying a high compliment to the Gas Manager (Mr. W. Smith), and to the Office Superintendent (Mr. Walch).

In the course of the remarks to which the address gave rise, Mr. Proctor expressed the hope that the Corporation were not yet at the end of the success of the Gas Department. He suggested that they should have mechanical stokers throughout. The development of the Electricity Department had not apparently interfered with the sale of gas in the past; and he trusted it would not do so in the future. There were large fields for the use of gas other than for lighting purposes. Mr. Holt spoke in favour of a reduction in price, now that the undertaking was paying so well; and Mr. Footill suggested that the Committee might reduce their charges for grillers.

In responding, Alderman Miles said the present was not an opportune time to reduce the price of gas. He reminded the Council that if the borough boundaries were extended as proposed by the Bill now before Parliament, a reduction in price would at once be made to the out-districts, which consumed one-fourth of the total supply. This would materially lower the profits, which, it must be remembered, would have to be spread over a greatly enlarged area. The Gas Committee were thoroughly alive to the importance of cheapening production; and they would use their best endeavours to secure future successes in this direction. He added that to introduce mechanical stoking at the Lum Street works would mean an expenditure of between £9000 and £10,000; but this would not stand in the way, if the Committee thought it would be beneficial for the ratepayers.

The balance-sheet and recommendations of the Gas Committee were then put to the Council and approved, without any further discussion on the part of members.

WEST BROMWICH CORPORATION GAS SUPPLY.

Annual Report of the Borough Accountant.

The report and statement of accounts in connection with the gas undertaking of the West Bromwich Corporation for the year ending March 31 last, have lately been issued by the Borough Accountant (Mr. T. Hudson). They show that the amount standing to the credit of the fund for the extinction of the debt on the date named was £15,688. The income from the sale of gas shows the largest increase since the establishment of the undertaking; being £2498, equivalent to 8½ per cent. over the previous year. The greater proportion of this increase was due to the extension of the prepayment meter system of supply, which has realized the highest anticipations. The number of these meters fixed during the year was 1465; making a total of 2247. The number of consumers was 7289; against 6007 in the previous year. The quantity of gas consumed was 248,439,675 cubic feet—an increase of 16,901,000 cubic feet. A new scale of charges was adopted for gas used for motive power; but it was only in operation during the last two quarters of the financial year. The income from residual products shows a satisfactory increase, apart from the larger production. The sale of coke yielded £5275, compared with £5048. The sale of tar produced an increase of £206; and the value of coke and breeze used at the works for firing purposes was £1327, against £1463. The amount realized by the sale of ammoniacal liquor was £275 more than before. The income from all sources was £42,760, against £38,951 in 1896-7—an increase of £3809. The total expenditure upon the trading account was £29,887, against £27,635—an increase of £2252. The manufacturing charges were £19,555, against £19,255—an increase of £300; and the cost of coal for carbonizing, £12,209, against £11,813—an increase of £396. The cost of public lighting was £26 17s. 2d. less than in the previous year. The gross profit on the trading account was £12,873, compared with £11,317—an increase of £1556. The gross profit was equivalent to a return of 6·99 per cent. on the capital employed. The balance of profit standing to the credit of the profit and loss account at the commencement of the year was £13,191, out of which £1500 was transferred in relief of the general district rate and £1300 to the credit of the depreciation fund account; leaving £10,391 to be carried forward for use as working capital. The surplus for the year is £4330, compared with £2835—an increase of £1495. The result of the year's working will enable the Gas Committee to contribute £1500 in relief of the general district rate, while leaving a large sum available for the reduction of the debit balance on the depreciation fund account.

ROCHDALE CORPORATION GAS FINANCES.

In an examination of the borough accounts for the past financial year, the "Rochdale Observer" says that the Gas Department has of late years not done so well as formerly; and there has been much disappointment with the smaller profits, especially on the part of those who forget that gas is now nearly 25 per cent. cheaper than it was ten or twelve years ago. This year, however, the department has shown something like its old profit-making form. The revenue from gas-rental was increased by £1882; and residual products realized £1235 more than in the previous year. As the expenditure is not much greater than before, the Committee have been able to give £2092 more in relief of rates. The gross profit on the year's working was £19,081, which was distributed as follows: Interest on loans, £4598; dividends on stock, £1949; sinking fund payment, £1713; reserve fund, £3000; surplus, £7821. Even this is not all, for the gas supplied to the street-lamps is not charged for. If it were, the profit would, of course, be very much larger. The reserve fund now stands at £10,157. At the last meeting of the Town Council, Alderman Petrie and Mr. Ford explained why the Committee deem it necessary to set aside such a large sum as £3000 yearly. They see before them a large expenditure on repairs and replacements; and as they cannot borrow money for such works, they must build up a reserve fund for the purpose.

THE STRIKE AT THE LLANELLY GAS-WORKS.

In the last number of the "JOURNAL" reference was made to the above subject. It may be remembered that it arose in consequence of the refusal by the Manager (Mr. A. R. Cawley) to recognize a claim set up by the men to themselves fill up a vacancy which had occurred in the retort-house caused by the dismissal of a drunken workman. The Manager filled his place by a man—a stoker—taken from the yard, who worked the shift. Afterwards, however, he returned to yard labour without permission, stating that, as it was not his turn to go into the retort-house, he would be mobbed by the other men. He was ordered back to his work; but as he refused to go he was at once discharged. The stokers asserted that they had a right to commence work in the retort-house in certain rotation as each year came round; and they objected to men in the yard—recent comers—being told off for the purpose. According to this contention, the Manager would have to send in the autumn for the men who were stoking the previous winter, even though they had not been employed by the Company during the summer—thus leaving him no choice of workmen, and securing for the summer men a constant situation, whether suitable or not. The whole of the stokers struck work without warning at two o'clock on Thursday, the 13th inst. Their places were then taken by labourers, lamplighters, &c., and work proceeded until nine o'clock on Friday morning, when, as the result of the tactics of the strikers, they were afraid to go on any longer. Though, owing to the state of the tinplate trade, there were plenty of unemployed men who would probably have been glad to accept the Company's offer of 4s. 3d. per eight-hour shift, it was impossible to get any of them to enter the works; and gas making consequently ceased. As no local men had been secured by noon on Saturday, and the time not having been sufficient to get them from other parts, the demands of the strikers had to be conceded, with the exception of the reinstatement of the man discharged for drunkenness. Summonses had been issued under the Conspiracy and Protection of Property Act; but they had to be withdrawn, or the town would have been in darkness. The result is that the Manager has no voice in the engagement of workmen; and the above-named Act appears to be rendered useless. The men are members of the Gas Workers' Union; and they acted upon instructions. They claimed that the rotation system was a contract, and that it had been violated by putting on a man out of his turn. The Company's legal adviser, however, says the existence of the custom of rotation does not constitute a contract; but even if it did, breaking it in the case of one man does not give the others a right to cease work without notice. The man concerned has his legal remedy. The Manager denies that there is any agreement with the men as to the rotation system. In the early part of the present year, he agreed to dismiss those not required in the order which his predecessor had engaged them; but he did not agree to re-engage them every season in the future in the same manner.

CHESTERFIELD GAS AND WATER BOARD.

Developing the Undertakings.

The Chesterfield Gas and Water Board having applied to the Local Government Board for the necessary sanction to borrow £1744 for gas purposes, and £662 for water purposes, Mr. E. A. S. Fawcett attended last Wednesday at the Municipal Hall to hold the usual inquiry. Mr. J. Middleton, the Clerk to the Gas and Water Board, explained that they were entitled to borrow, over and above the purchase cost of their undertaking, a sum not exceeding £30,000. The present was the first application that had been made. The Inspector asked whether there had not been a previous application for £15,000; and why the present sums were not included in that. Mr. Middleton replied that the £15,000 was for works to be undertaken; but the present sums were in respect of work already done. But, inasmuch as the accounts had not been audited at the time of the first application, the Board could not include the sums now applied for. The line of policy formulated by the Board was that of defraying, as far as possible, out of revenue, the cost of renewals and extensions. But since the gas and water undertaking came into their hands several entirely new features had been developed. With a view to increasing the consumption of gas, and to satisfy the demand from residents, cooking-stoves were now supplied. Then the Board had extended the gas-mains in many directions, and had put up a large number of new lamps. A show-room had also been opened at the works. Automatic prepayment meters to the number of 258 had been fixed during the first seven months of the system being adopted; and the ratio of increase was still going on. These were all features which the Board believed could legitimately be charged to their capital account. The Inspector inquired why the work had been done before making the application for sanction to borrow the money? Mr. Middleton said the Board were pressed at the outset to adopt the new features; and they were not disposed to wait for the sanction of the Local Government Board, which would have meant keeping their customers waiting. The Inspector said he gathered from Mr. Middleton's statement that the Board were prepared to risk the danger of having to pay the sums mentioned out of their revenue in case the Local Government Board did not give their sanction. Mr. Middleton said the Board did not anticipate any risk. With reference to the £662 for water purposes, it was for main extensions, and for a new pumping-station. The latter was an entirely new departure. The mismanagement of the late Gas and Water Company in regard to the water supply was something approaching a public scandal. The pumping-station was at once put down by the new Board in order to supplement the supply from the two reservoirs. The Inspector: Is this pumping-station scheme a temporary measure? Mr. Middleton said that depended upon what eventuated from a new and large scheme now in hand. But in all probability the pumping-station would continue to be used concurrently with the large scheme for six or seven years at least. With reference to the other scheme, boring operations (carried on out of current revenue) were now taking place; and it would depend to a great degree upon the success which attended these boring operations whether or not the Board constructed another reservoir. They suggested that the money should be borrowed on a ten years' repayment basis. The inquiry then closed.

Reductions in Price.—The Brixham Gas Company have resolved to reduce the price of gas from 4s. 3d. to 4s. per 1000 cubic feet. The Newbury Corporation have reduced the price of gas to 4s. 3d. per 1000 cubic feet, with the same discount as at present—viz., 4d. per 1000 cubic feet; thus making the net price 3s. 11d.

Sales of Shares.—At the Mart, Tokenhouse Yard, E.C., last Wednesday, Messrs. Fox and Bousfield submitted to auction, by order of the Court of Directors of the Grand Junction Water-Works Company, £30,000 issue of new capital in 600 £50 per cent. shares fully paid. The price realized was from £95 to £103 per share. They also sold parts of freehold shares in the New River at prices averaging £129,600 per share. At Bristol on the following day, Mr. A. H. Daniel (of Messrs. Alexander, Daniel, and Co.) submitted for sale £10,000 worth of Bristol Water-Works 7 per cent. maximum consolidated ordinary stock in lots of £100; the reserve price being £154 per cent. The whole of the stock was sold, chiefly in lots of ten; and the prices ranged from £157 to £162. He also offered for sale £20,000 of 3½ per cent. debentures in the Company; the reserve price being £124. Only two lots were sold, at £124 5s.; and the rest were withdrawn. At Tunbridge Wells, on Thursday, £60 of consolidated ordinary stock in the Tunbridge Wells Gas Company was disposed of for £172 10s., and £50 of similar stock fetched £140. Two lots of £50 consolidated "B" stock realized £110 and £105 respectively; while £20 of consolidated "C" stock went for £40. At Bury St. Edmunds, the next day, 30 £10 shares of the 1859 capital of the Gas Company were put up for auction, and fetched £20 15s., £20 10s., and £20 5s. each. Messrs. Rayner and Bridgland last week offered 250 preference shares (6 per cent.) of £20 each in the Gravesend and Milton Water Company; being a further portion of the capital authorized by the Company's Act of 1897. They were disposed of at an average price of £38 11s. 9d. each. A number of £10 new ordinary shares in the South Hants Water Company recently changed hands at prices ranging from £16 11s. 3d. to £17 apiece.

BRUSSELS MUNICIPAL GAS SUPPLY.

The Gas Committee's Report on the Past Year's Working.

According to the report of the Gas Committee of the Brussels Municipality for the past year, which was presented to the Council on the 9th inst., the total quantity of gas sold was 28,680,664 cubic metres, or about 1,012,428,000 cubic feet, as compared with 26,315,522 cubic metres, or 928,938,000 cubic feet in 1896; being an increase of 2,365,142 cubic metres, or in round figures 84 million cubic feet. This additional consumption the Committee attribute partly to the International Exhibition. The total production of gas reached 35,973,400 cubic metres (1,269,861,000 cubic feet); and it was disposed of as follows:—

	Cubic Metres.
Night gas, at 14c. and 13c. per cubic metre	23,665,588
Municipal establishments, at 10c.	932,480
Gas-engines, at 10c.	1,665,758
Industrial purposes, at 10c.	1,056,115
Heating purposes, at 10c.	625,198
Illumination devices, balloons, &c.	128,934
Artizans' dwellings and miscellaneous	606,591
Total sold	28,680,664
Public lighting and illuminations	4,748,185
Used on the works, &c.	1,355,241
Unaccounted for	1,189,310
Total production	35,973,400

The total expenses amounted to 3,996,642 frs. (£159,866); the receipts, to 5,684,029 frs. (£227,361)—leaving a balance of 1,687,387 frs. (£67,495), as compared with 1,525,069 frs. (£61,003) in 1896. Allowing 68,319 frs. for the increased value of the stores, the profit resulting from the undertaking is brought up to 1,755,706 frs. (£70,228).

In the manufacture of gas, 118,185 tons of coal were carbonized; and 946 tons of oil were employed for the purposes of enrichment. While the solid material used was 4821 tons more than in 1896, the liquid was just twice as much. The quantity of coke sold at the works was 728,608 hectolitres (about 2,003,672 bushels); and the deliveries of this product in the provinces and abroad cleared off the whole of the stock. The tar products were disposed of regularly, but at not very remunerative prices. Sulphate of ammonia showed a tendency to improve in value at the close of last year. The breeze was utilized, as before, in the manufacture of compressed fuel, which is employed in heating the retorts and generators. Some of the ash was sold for making mortar and for keeping up the roads. The foundations have been laid for a new retort-house, which forms part of the extensions now being carried out at the works; and the principal buildings are expected to be roofed in during this year.

The total amount of capital employed in the undertaking at the close of 1897 was 22,308,579 frs. (£892,343), as compared with 20,473,133 frs. (£818,925) at the corresponding period of 1896. Mains to the extent of 179,050 metres (196,955 yards) occupied the subsoil of the city on Dec. 31, 1897, as compared with 176,430 metres (194,073 yards) at the end of 1896. The leakage amounted to 3·3 per cent. of the total quantity of gas sent out. The number of meters in use on the 31st of December last was 22,507; being an increase of 2405 in the year. There were 762 prepayment meters fitted up; making 1431 meters of this kind in use in the city. Interior fitting work was brisk last year; the number of orders received being 1207, as compared with 945 in 1896. At the close of last year, there were in service 5256 of these inside installations, as well as 2627 rising pipes. The gas-stoves on hire numbered 13,038, against 10,223; and 304 gas-engines, representing 1220-horse power, were at work—the larger number being in printing, lithographing, and bookbinding establishments. The Committee let on hire outside lanterns at rates which include the supply of gas and the maintenance of the lamp, which is fixed at the cost of the consumer. For a single-burner lamp the charge is 50 frs. per annum; for a five-burner lamp, 100 frs. At the end of last year, 25 of the former, and 146 of the latter had been placed, as compared with 17 and 125 at the corresponding period of 1896. For the public lighting there were employed 5885 lamps, of which 653 were fitted with high-power burners. The total number of hours of lighting was 3822; being 23 less than in 1896. Between midnight and one o'clock in the morning, 640 high-power and 955 ordinary burners are extinguished.

It may not be without interest to compare some of the figures in the report under notice with those for the year 1887. The population of Brussels was then 176,104; and the quantity of gas sold per inhabitant was 3247 cubic feet. Last year the population was 195,700; and the amount of gas burnt per inhabitant was 5190 cubic feet. Ten years ago, the number of meters fitted was 11,646; there were 235 interior installations, and 148 rising mains, but no stoves in use. Last year, the figures were: Meters, 22,507; interior installations, 5256; rising mains, 2627; stoves, 13,038. In 1887, the average price of gas was 3s. 2d. per 1000 cubic feet; last year it was 2s. 9½d.

SINGAPORE GAS COMPANY, LIMITED.

A Proposal to Purchase the Works.

The Annual General Meeting of this Company was held last Thursday, at the Cannon Street Hotel—Mr. Samuel Spencer in the chair.

The Secretary (Mr. R. M. Christie) having read the notice convening the meeting,

The Chairman said that, before commencing the business, he thought it would be well to inform the shareholders as to the contents of a cable and letter which were forwarded to Singapore after an extraordinary general meeting which was held to consider a proposal of the Municipal Commissioners to purchase the Company's works.

The Secretary read the letter which was addressed to the Manager, Mr. Albert Ford. Having mentioned that the extraordinary meeting of the shareholders was held on April 14, it stated that, previous to the meeting, several of the largest shareholders attended at the office of the Company, and discussed the situation with the Directors—the outcome being that the following resolution was unanimously passed at the extraordinary meeting: "That the Directors be authorized to negotiate with the Municipal Commissioners of Singapore for the sale of the Company's plant, goodwill, and business; the amount to be ascertained by friendly arbitration." Mr. Ford was asked to communicate the foregoing to the President of the Commissioners, and to take steps to have the contract extended to the end of 1899, in order to give time for the negotiations. The letter further intimated that, if the Commissioners proposed to give the Company a lump sum, the Directors would call a special meeting of the shareholders, and, if the sum seemed satisfactory, they would recommend them to accept it. Mr. Ford was also requested to put before the Commissioners a proposal made by the Company's largest shareholder—viz., that the Company might be prepared to pay £5000 for incandescent lanterns on condition that they obtained at least a ten years' contract, with a price of (say) not less than 9s. 3d. sterling per lamp per month, or a fifteen years' contract at not less than (say) 9s. sterling per lamp per month.

The Chairman said the letter showed exactly what had been done on this side since the extraordinary meeting. The previous day, the Directors received a cable, which was not favourable; and they proposed to consider it at the close of the ordinary meeting. The matter, however, had been discussed so far *in camera*; and the Directors therefore considered it would be better to continue that course. Continuing, the Chairman moved the adoption of the report and accounts. He said it was with much pleasure that the Directors were able to say that the past year—notwithstanding the rate of exchange was the lowest they had experienced—was the best in the make of gas per ton of coal and receipts that they had had. This favourable result was largely due to the able management of Mr. Ford; and the best thanks of the shareholders, he (the Chairman) was sure, would be accorded him. This was the thirty-sixth annual meeting; and, during the whole of this period, the dividend paid had only averaged the inadequate rate of 4¾ per cent. He had no hesitation in saying that, if a better return than this had not been foreshadowed when the Company was formed, and with every prospect of realizing it, the money would have been far better employed at home, where it would have earned at least twice the amount—indeed, as a matter of fact, he had looked at the original prospectus of the Company, and found a clause in it which gave the estimate of profit as 12 per cent. The actual result had been very disappointing. A few years before the great fall in the price of silver, they were paying the fair rates of 7 or 8 per cent.; and in 1890, they paid 6 per cent., with the dollar at an average of 3s. 4¼d. Since that date, they had passed the dividend for three years; and for the other four years, including the past year, they had only paid 7½ per cent. altogether—an average of not quite 2 per cent. per annum. It was, however, only fair to mention that during the seven years, their writings off amounted to £9219; and this, with keeping the works in thorough repair, had been equal to 2 per cent., or an earning power of 4 per cent. for the period. On the arrival of Mr. Ford at Singapore, he urged the Directors to rebuild the beds of retorts with up-to-date improvements; and he had the new ones practically at work from June to December last year. The results had been highly satisfactory, giving a large increase in the make of gas per ton of coal carbonized, and helping them in a great measure to the position they now stood in, as well as enabling them to pay with ease a dividend of 2½ per cent. for the year. The quantity of coal used during the twelve months was 183 tons less than in the previous year; and the make of gas was 1¼ million cubic feet more—the yield per ton being 10,075 cubic feet, with a leakage of 5½ per cent. The cost of the new retorts was £1256; and for the present the Directors considered it better to treat the amount as in suspense. The accounts showed an increased loss on exchange, amounting to about £2700 more than last year; making in all £10,946 for the year. The extra cost of coal was about £700; and it was caused by the greatly increased rate of freight, which was just 50 per cent. more than it was about eighteen months ago. There was also an unusual amount of £140 for law charges, which he was sorry to say arose from sueing a man on his guarantee in Singapore who it was thought was responsible for a quantity of stolen tar. Mr. Ford secured the best advice, and had every assurance that the Company would win; but unfortunately the case went against them. There was therefore nothing to do but to pay, and write the sum off. At the same time, the Directors were of opinion that Mr. Ford did the right thing; and they felt certain the moral effect would be a good set-off for the loss. The receipts for the year, as he had mentioned, were the best they had had; and after paying the dividend recommended, they carried forward the sum of £1921. Had it not been for the increased loss caused by the low exchange, they would have been in a position to have paid a better dividend. The prospects for the current year were much more favourable; and the Directors had the fullest confidence that the returns would be better than those for 1897. The coal in stock and on the way to Singapore would carry them on till April next; so that they would not require to buy any more for six months, by which time the Directors hoped they would secure further supplies at a less rate per ton than was ruling now, and also at a considerable reduction in the freight.

Mr. W. T. Batten, in seconding the motion, said it was very satisfactory to the Directors to see the great improvement which had resulted in the working through the new retorts. They had been in the unfortunate position for many years of not being able to spend more than was absolutely necessary in renewing their machinery; but in some respects there would now be no necessity for continuing the policy which the Board had so far pursued.

Mr. Robins considered it was a matter for congratulation that the Company had now turned the corner—at all events, the report was a hopeful one.

Mr. H. W. Smith (the late Manager) said he noticed in the report for 1896 the Directors said that the expenditure for the year had been heavy; while in the present report, they stated that the accounts showed a considerable improvement over those for the previous year, and that this was due to the able management and to the carbonizing. Looking through the figures, he found the improvement was not so much owing to the management as it was to the increase in the revenue arising from the higher charges for the public lamps and the revenue derived from the Jubilee celebrations. Comparing the figures with those for the year which was characterized as a bad one, he found that coal had increased by £715; trade and general charges, by £37; rates and taxes, by £46; salaries, by £54; wages, by £302; loss by exchange, by £2296; bad debts, by £11; the retort account, by £371; and law charges, by £123.

Leaving out coal and loss by exchange, they had there an increase in expenditure of something like £950. Looking on the revenue side of the account, they found an increase of £5857; and yet they only made £1614 extra profit. Of course, they had to allow the additional cost of coal and the loss on exchange; but even then, to his idea, the working was not quite so good as the Directors were giving the Manager credit for. Their position was simply this: They had more money in hand, and were consequently better able to stand the strain of increased expenditure. He congratulated the Directors on the greater revenue.

Mr. BATTEN said the cause of some of the increased expenditure referred to by Mr. Smith had already been dealt with by the Chairman. As to the extra cost of coal, that was explained by the increased rates of freight, and the extra price at the pit's mouth. Then regarding wages, they had to pay the stokers considerably more—to some extent on account of the fall in the value of money at Singapore, and also owing to a strike of the men. Generally speaking, the larger expenses were explained by increased business.

Mr. SMITH: A good deal of the increase arises from the additional charge for public lighting.

Mr. BATTEN stated that there had been some outlay in experimenting with incandescent lighting; and they had had to pay more for coal and freight—in fact, freights were 50 per cent. higher. Then they had been cutting off a great number of unremunerative services, and getting their mains into order, with the result that they had brought down the unaccounted-for gas to about 5 per cent., which was very reasonable, considering they had 50 miles of mains. The increased revenue was partly from public lighting, but not entirely. The year after Mr. Smith left them, the gross revenue rose from $80,600 to $81,400; while during the past year it had increased to $98,700. To meet current charges, they had now in hand £1597, which was a position they had not been in for many years.

Mr. B. GREEN pointed out that, in consequence of the strike of the men soon after the new Manager reached Singapore, they had to pay them higher wages; and, in addition to this, with an increase of something like £4000 in the gas-rental, there must be more work to do. So that he did not think the rise of £302 in wages was a serious matter.

Mr. SMITH believed the Directors and Mr. Ford did their utmost for the Company. All he complained of was that in 1896 the Directors lamented the heavy expenses, while now they attributed the improved results to better management, instead of to increase in revenue.

The motion was unanimously carried.

On the motion of the CHAIRMAN, seconded by Mr. SAMUEL WHILE, a dividend was declared at the rate of 3 per cent. per annum.

The CHAIRMAN next proposed, and Mr. SMITH seconded, the re-election of the retiring Directors (Messrs. A. E. Stephenson and B. Green). The proposition having been carried, Messrs. Magnus Ohren and T. Guyatt were re-appointed Auditors on the motion of Mr. T. A. GREENE, seconded by Mr. SIMMELKJÖR.

The usual complimentary votes were passed to the Chairman and Directors, and to the Manager and Secretary and their staffs.

SOUTH AFRICAN LIGHTING ASSOCIATION, LIMITED.

The Ninth Annual Meeting of this Association was held last Wednesday, at the Offices, 90, Cannon Street, E.C.—Mr. D. FORD GODDARD, M.P., in the chair.

The CHAIRMAN, in moving the adoption of the report, said it gave him great pleasure to be able to state that everything in connection with the Association was satisfactory. The sales of gas, both at Port Elizabeth and Grahamstown, were increasing; and the methods of production were also improving. The Manager reported that the extra make of gas in 1896 had been effected with a smaller consumption of coal; and this improvement had been especially marked in the latter half of 1897. In addition, the loss from leakage had been still further reduced, and now amounted to 7·6 per cent.; and this in spite of difficulties and damage occasioned by the disastrous flood at Port Elizabeth in May, 1897. Local demand had also increased the coke sales of the year, owing to the scarcity of fuel; while coal had actually cost considerably less per ton. With regard to the price charged for gas, the Directors had been able, as from the 1st of December last, to reduce the price at Port Elizabeth by a further 10d. per 1000 cubic feet; and the Board had that day determined to effect a substantial reduction in the price at Grahamstown, to come into operation on the 1st of July next. At the latter town, no doubt, the present figure was high; but with a new undertaking it was always a little difficult at first to determine what was a fair and profitable price to charge. These reductions it was hoped would lead to a substantial increase in the future consumption of both towns. The new plant was now at work and giving satisfaction. It had, of course, been conducive to the improved results in manufacture already alluded to. The work on the new holder was progressing; and the new boiler-house and four sets of new retort-benches were in hand. Further extensions, by the provision of additional coal storage, was the next matter that must be dealt with. The land for this was already provided; and the Directors would give the matter their careful attention. With regard to raw material, the Association had lately been using Australian coal with good results. They had been negotiating for some time for a trial shipment of American coal; but this they had not yet been able to definitely fix. This would show the shareholders that the Directors were anxious to try every means to make the working a success. The works at Grahamstown were in good order, and the make of gas had increased by 22 per cent. over that of 1896. On the question of the accounts, he might remark that the reserve fund had now reached a handsome figure; and the use of the money in the business enabled the Association to add considerably to the profits. The sum of £1000 which the Board recommended should be added to the plant depreciation account was a provision to cover any possible depreciation, and to provide for renewals that might arise in the future. The stocks were heavy; but their value had been carefully considered, and the fullest information had been furnished from the other side, with details of all the items. It was, of course, necessary, in the case of the Association, where their operations were conducted so far away, to keep a considerable stock both for their own use and also to meet their customers' requirements promptly.

Mr. W. WOODALL, M.P., seconded the motion.

Mr. MITCHELL thanked the Chairman for the details he had given, and supported the policy of reducing the price of gas as much as possible.

The CHAIRMAN, in reply to remarks and inquiries by other shareholders, stated that the question of using water gas had been under the consideration of the Board; but there were difficulties at present in the way. The bonus to the staff had been done away with; but their salaries had, of course, been consequently increased. The Directors were satisfied with their staff, and had every confidence in them.

The motion was carried unanimously.

A resolution proposed by the CHAIRMAN, and seconded by Mr. A. L. DON—"That a final dividend of 6 per cent., free of income-tax (making with the interim dividend 10 per cent. for the year), be and is hereby declared"—was also carried unanimously.

On the motion of Mr. WOODALL, seconded by Mr. HOLLAND, Mr. Goddard, the Chairman, was unanimously re-elected a Director; and Mr. J. G. Griffiths, F.C.A., was also re-elected as Auditor.

Mr. J. KING proposed, and Mr. WHITE seconded, a vote of thanks to the Board and the officials for their services during the year; and the proposition was unanimously approved.

The CHAIRMAN having replied, the proceedings terminated.

ELECTRIC LIGHTING NOTES.

The Town Clerk of Leeds has received from the Local Government Board an intimation that the Provisional Order enabling the Corporation to issue stock, irredeemable or otherwise, for the purchase of the undertaking of the Yorkshire House-to-House Electricity Company has been made, and would be submitted to Parliament for confirmation.

The Bangor City Council have decided to amend the application already made to the Local Government Board for sanction to borrow £10,000 for electric lighting by adding £3500, which is required for extending the supply of current to Upper Bangor. Numerous ratepayers have signed a guarantee bond, extending over five years, to meet any deficiency that may arise on the installation.

At the meeting of the Shoreditch Vestry last Tuesday, the Electric Lighting Committee presented a statement of accounts showing the work for the nine months ended March last. The power for the dynamos, it may be remembered, is obtained from the dust destructor. Altogether, 491,107 units had been generated, of which 80,791 units had been used for lighting the streets, 203,504 units by private consumers, 156,725 units used on the works, and 50,087 units unaccounted for. The accounts showed a profit balance amounting to £1701. Mr. Kershaw, the Chairman of the Committee, said that certain items included in the accounts belonged to the dust destructor proper; and after allowing for these and other sums, there was a profit of £4264, which, upon their capital outlay of £65,000, meant a dividend of 6½ per cent. They had in the nine months the most phenomenal results obtained by any municipal electric light undertaking in the country. After allowing for the proper repayment of principal and interest, they had a net balance of £2072; and he thought the Committee would repay the amount advanced to them out of the rates, and then have a balance in hand of £700—and this upon nine months' working. Mr. Winkler criticized the accounts, and said they were incomplete, and did not bear out all that was said of them. He maintained that when the dust destructor account was presented, a loss would be found to be the result of the joint working. Mr. Vaudy, on the other hand, supported the accounts, and said that if the Vestry sold to a company they would make a profit of £50,000. It was resolved to borrow a further sum of £15,700 for the purposes of the Committee.

The Reigate Town Council have decided upon putting down an electric lighting installation in the borough, although they stand committed to promote a Bill to empower them to acquire the Redhill Gas Company's works, and also incidentally those of the Reigate Gas Company. In regard to electric lighting, they have instructed Mr. F. H. Medhurst to prepare the plans and specifications for an installation on the lines of a report which he presented to them, with certain modifications suggested by Professor Silvanus Thompson. In view of the projected acquisition of the gas-works, the question was recently raised at a meeting of the Electric Lighting Committee whether it would not be an economical arrangement to erect the generating stations on the gas-works site; and they therefore consulted Professor Thompson and Mr. Medhurst on the point. The answer of the first-named gentleman is interesting. He said: "I beg to say that my opinion is entirely adverse to such a step. My answer would be the same even if the gas plants were owned by the borough. The cost of generation, the interest upon capital expended upon the electric machinery, and the standing charges, would be greatly increased. Further, if it were decided on the merits of the question hereafter to adopt gas-engines instead of steam-engines in the electric lighting station, I should advise you that it would be cheaper to erect special gas-producing plant, making a cheap non-illuminating gas, on the spot, than to use gas from the existing supply of illuminating gas, whether the latter were owned by the present Companies or by the borough. Hence it follows that, in my opinion, there is not in itself any advantage in putting down the electric lighting station contiguous to an existing gas plant. Still less reason is there for taking the uneconomical course of putting down two electric lighting stations simply in order to put them at places where there is no inherent advantage in putting them. At the present time, engineers in London are finding out the disadvantages of there being many electric lighting stations, and are seeking to diminish their number, and concentrate the work in fewer centres. The City of London Company, which had formerly two stations, one on each side of the Thames, has given up one of them. Under these circumstances, it appears to me to be entirely unwise to entertain any project for erecting two stations for the electric lighting of your borough." Mr. Medhurst's opinion was that it would be "a fatal blunder to have two electric lighting stations, each situated at one of the gas-works, for the lighting of Redhill and Reigate. The initial cost of the scheme would be greatly increased, standing charges would be almost doubled, and then it is a great question when, if at all, such a scheme would pay interest and sinking fund, as well as working expenses." In view of these expressions of opinion, the Town Clerk has been instructed to take the necessary steps to secure a site for the station.

METROPOLITAN WATER SUPPLY COMMISSION.

Twenty-second Day—Monday, May 16.

(*Viscount* LLANDAFF, *Chairman*, *Sir* JOHN E. DORINGTON, Bart., M.P., *Sir* G. B. BRUCE, M.Inst.C.E., *Major-General* A. DE COURCY SCOTT, R.E., *Rt. Hon.* J. W. MELLOR, Q.C., M.P., *Mr.* A. DE BOCK PORTER, C.B., *and Mr.* R. LEWIS.)

The sitting took place at the Westminster Town Hall.

The following Counsel are engaged: Mr. POPE, Q.C., and Mr. CLAUDE BAGGALLAY, Q.C., for the New River Company; Mr. LITTLER, Q.C., and Mr. LEWIS COWARD for the Kent Water Company; Mr. PEMBER, Q.C., for the Lambeth, East London, Grand Junction, and West Middlesex Water Companies; Mr. RICKARDS for the Chelsea Water Company; Lord R. CECIL for the Hertfordshire County Council; Sir JOSEPH LEESE, Q.C., M.P., for the Kent County Council and Kent Local Authorities; Mr. BALFOUR BROWNE, Q.C., and Mr. FREEMAN, Q.C., for the London County Council; Sir R. NICHOLSON for the Middlesex County Council; and Mr. GABRIEL P. GOLDNEY (Remembrancer) for the Corporation of the City of London. The Southwark and Vauxhall Water Company are represented by Messrs. BIRCHAM AND CO.

M. *Gaston Cadoux*, Chef de Bureau à la Prefecture de la Seine (Secretariat du Conseil Municipal de Paris), Secretarie Administratif du Comité du Budget, was the first witness called. Owing to his inability to express himself accurately and fluently in English, Mr. Granville Smith, a member of the London County Council, sat by him while he was under examination, and rendered him assistance when necessary as interpreter. In reply to the Chairman, witness stated that the Municipality of Paris purchased the undertaking of the one Company which was then supplying water to Paris in 1860. The Company were supplying water pumped from the Seine and the Marne. Under the contract of purchase, the city of Paris agreed to pay to the Company fifty annuities of 1,160,000 frs.—a total of some 58,000,000 frs.—for their lands, machinery, mains, reservoirs, and plant of every kind. During this period of fifty years, which would expire in 1909, the Company were to continue to supply the water. Under this arrangement, the City Engineers delivered the water into the municipal reservoirs without the Company having anything to do with it or having any right to object; they having only to sell it to the consumers. The Company acted as collectors of the rates; but had nothing to do with the fixing of them. The profits of the Company were based upon the receipts collected by them. The scale was 25 per cent. on sums between 3,600,000 frs. and 6,000,000 frs., and the percentage decreased to 20, 15, and 10 per cent. for sums between 6,000,000 frs. and 12,000,000 frs. Beyond 12,000,000 frs. the percentage was 5 per cent. Witness could not say what the capital of the Company was, nor what dividends they had paid. His opinion was that the transfer of ownership and management of the Company to the Municipality had been much to the advantage of the city. The quality of the water supplied had improved remarkably, owing to the bringing of water from perfectly pure springs; yet the charges had been much reduced. In 1860, the tariff was 10 or 12 per cent. more than in 1880. The tariff of 1880 introduced, for the first time, the charge for small consumers. Since 1880, the charges had been lowered considerably. A small supply of 125 litres per day was granted for a yearly rate of 20 frs. The price for 250 litres per day was lowered to 40 frs. a year; that of 500 litres, to 60 frs.; and that of 1000 litres, to 120 frs. (spring water). At the same time, the price of river water for industrial or commercial uses was fixed at half that of spring water. Thus for 20 frs. one could use 45,625 litres of water in the year. Nearly, but not quite, all the consumers were supplied by meter.

The CHAIRMAN: How can you tell that a consumer is not drawing more than 125 litres a day?

Witness: The gauge-taps cannot give more than 125 litres a day.

In answer to further questions, witness said at the present time spring water was charged at 35 c. per cubic metre for consumption; but if used for the working of machinery, because of the pressure it possessed, the charge was raised to 60 c. In buildings in which the rent was assessed at not more than 800 frs., water was supplied by contract at 6 frs. for tenements under 300 frs.; 9 frs. for those from 300 to 400 frs.; 14 frs. for one from 400 to 640 frs.; and 20 frs. for each one between 640 and 800 frs. They had changed their system of charge to a percentage on the rent, instead of charging on the water; but this was only for houses under 800 frs. There was a specially appointed body for preventing the pollution of the Seine; and works were being constructed which it was expected would result in the Seine being much less polluted than formerly. Their duties related to the sources, sanitation, and sewers generally. As soon as Paris bought the Company—the Compagnie Générale des Eaux—they incurred great capital expenditure in bringing in spring water from a distance; this step being due mainly to the insanitary condition of the river, but also to the lack of quantity in the river supply. Private dwellings and industrial establishments above Paris had been in the habit of sending their refuse into the river; but last year a law was passed under which such impurities were to be destroyed before the liquid was discharged into the river. Control in this matter, however, was very difficult to exercise. As soon as Paris became possessed of its own water supply, it set to work to bring in a supply of pure water. The first important source was that of the Dhuis. The total length of the aqueduct was 131,162 metres; and the water came from the Verdon and Surmelin Valleys, whence it was taken to the reservoir at Menilmontant by gravitation, at the natural fall of 0·10 metre per 1000 metres. The average volume thus brought each day into the reservoir, which held 95,000 cubic metres, was 20,000 cubic metres. The cost of the supply, including the purchase of the springs, compensation to the millowners, &c., and the building of the aqueduct, amounted to 18,000,000 frs. The reservoir, he explained, had several divisions in it, and thus really consisted of a number of reservoirs.

The CHAIRMAN: Then I believe the city of Paris constructed an aqueduct to get water from the Vanne?

Witness: Yes; the Vanne was brought in between 1870 and 1874, by an aqueduct of 173,000 metres—16,000 metres being on arches. These works presented difficulties, and cost 39,000,000 frs. The water also comes by gravitation into the Montrouge reservoirs, which have cost about 10,000,000 frs. A small secondary derivation from the Cocheysies springs was made in 1881-8. It cost 3,180,000 frs., and has allowed a regular average of 120,000 cubic metres per day.

In both these cases, is it spring water?—Very pure spring water. It is from natural springs; but I do not know if it comes from chalk.

Then, I believe, you went to the Vigne and the Avre?—Yes. The Vigne and the Avre necessitated an outlay of about 35,000,000 frs. for a quantity of 115,000 cubic metres, brought by an aqueduct 102,000 metres long into the Montretout reservoir, not yet quite completed, but working since 1896. This reservoir will be finished this or next year.

Witness went on to say that the city had also obtained power to proceed with bringing water from the Loing and the Lunain, at a cost of 25,000,000 frs., which it was hoped would give from 115,000 to 120,000 cubic metres per day. Further capital expenditure was contemplated; a plan having just been presented to the Municipal Council for the supply of water until 1935, which would entail an expenditure of 120,000,000 frs. But this supply, besides being quite sufficient for the city, would enable some to be given to villages adjacent to Paris. To meet the expense, bonds or shares were issued to the public; the security being the credit of the city of Paris. The Municipal Council had no power to levy rates; the State received with its own taxes those which were for the benefit of the Municipality, and which were afterwards handed over to them. There were special reservoirs for the river water and the spring water. In very dry summers, they were obliged sometimes to use river water for domestic consumption; notice being always given of the fact by placard and in the newspapers.

Major-General SCOTT: Is the river water filtered before delivery?

Witness: Not always. It is only when the spring water is exhausted that the Seine water is used. After this water has passed through the pipes, it has been seen that they were bacteriologically in a very bad condition. It is the object of the city to do away with the use of river water, which, however, is now generally employed only for purposes such as street watering.

At present, I understand, though there are some filters, they are not sufficient to filter the whole of the water?—We do not find that filtration is very economical and efficacious; and we discover that the cost is not in proportion with the results obtained. We consider it is cheaper to have spring water than to filter the Seine water. Further, the supply from the springs being higher is more regular.

In answer to further questions, witness said that when spring water was used in pipes that had formerly contained river water, there was a great development of bacteria. He therefore considered it very bad to change the water in the pipes. But after the spring water had been used for several days, the development ceased. Paris, it was hoped, would be entirely supplied with spring water this or next year. At present river water was used for washing streets, the parks, and gardens; but the two waters did not pass along the same pipes. Where necessary to water the streets in great abundance—such as in the Rue de Rivoli and the Bois de Boulogne—there was a double canalization, so as to bring Seine water without injuring the spring water. There was no communication between the two sets of pipes, except at the reservoir. In 1896, the consumption of spring water per day in Paris was 181,000 cubic metres, or 72 litres per head; of river water, the corresponding figures were 128,000 cubic metres, or 51 litres respectively—or, taking the two together, 309,000 cubic metres, and 123 litres. These figures related to private service, including industrial and trade uses, but not the watering of the roads. The quantity used in 1896 for private services was 112,785,000 cubic metres; and for public services, 82,942,000 cubic metres—a total of 195,727,000 cubic metres. In the same year, the cost of the service, without reckoning loans or their amortization, was 5,101,511 frs.; and the receipts, 16,999,411 frs. The net produce was therefore 11,897,900 frs., out of which interest and sinking fund had to be deducted. Witness calculated that for the next twelve or thirteen years the city would lose about 1,500,000 frs. on the water service. The 16,000,000 frs. included 1,260,000 frs. from the canals. As regarded the amortization of the loans, 60 years for some and 75 for others was the period over which these expenses were spread. As to the deficiency which the city had to make up, witness said that it had frequently been suggested that the charges should be increased so as to meet it; but the Municipal Council would not hear of such a thing, as they wished always to diminish rather than increase the rates. The general result of the purchase had been to reduce the charges more than 15 per cent. If the old tariff had been maintained, undoubtedly the charges of twenty years or so ago would long since have been covered; but in 1892-94, the enormous sum of 35,000,000 frs. was spent, on which no return had yet been made, so that it could not be expected that the charge in respect of this sum would be met. The receipts were more than sufficient to cover the water actually used or drunk. The object of the city had been to deliver water at as near cost price as possible.

By Major-General SCOTT: Behind the Municipal Council of Paris, was an official to whom the votes of the Council had to be submitted. If he disagreed with them, he could refer them to the Minister for the Interior, who had a practical power of veto. In the case of a new project, if the town were able to do the work without a loan, the Government did not interfere. There was a double analysis of the water—one by the Municipal Council and one by the State.

By Mr. LEWIS COWARD: The gauge-tap was in general use when the water was supplied by the Company; but the Council wished to abolish it on account of the abuses and fraud it engendered.

Sir *Alexander Binnie* was recalled, and handed in some tables bringing up to the year 1897 statistics with regard to the various Companies which he had formerly put in. He also produced diagrams and tables showing the effect produced in the years 1885, 1887, 1893, and 1896 on the natural and actual flow of the Thames at Teddington Weir, by the average abstraction of 300 million gallons a day under the Staines scheme, with reservoir capacity of 28,000 million gallons, and a supply to London given in the mean proportion of the years 1896 and 1897—the minimum flow of the Thames at Teddington Weir being 200 million gallons a day. Having given the figures for 1885, witness went to those of 1893, which it was necessary to consider as a basis because that was a year of very small rainfall. The natural flow of the river in that year at Teddington was 992·4 million gallons daily, and the actual flow 888·3 million gallons; while the resultant flow, under the Staines scheme of supplying

300 million gallons a day, supposing it were carried out, would have been 730·9 million gallons a day. There were in that year 28 days when the actual flow of the river fell below 200 million gallons; 337 days on which the Thames would have been drawn on to fill up reservoirs; and 188 days on which the flow over Teddington Weir would have been reduced to 200 million gallons. The natural flow of the Thames during the period of minimum flow (the 188 days) would have been: Average, 405·2 million gallons; maximum, 671·6 million gallons; and minimum, 252·3 million gallons. The actual flow during the same period would have been: Average discharge at Teddington, 297·9 million gallons; maximum, 575 million gallons; and minimum, 141·3 million gallons. The average rainfall for the year was 22·08 inches. The result on the reservoirs was that they would have been full up to May 31; empty on Oct. 8 and 9; and bottom impurity drawn on from Nov. 8 to 15, to the extent of 820 million gallons. He was confident he had not over-estimated the reservoir capacity that would be required—viz., 28,000 million gallons. The enormous quantities of water which flowed down the river in times of flood, such as at the beginning of 1893—were for the most part wasted; and they would continue to be so unless reservoir capacity was provided to an extent that could scarcely be contemplated. These great floods were practically useless for purposes of supply; but they were of great value in scouring the river. Witness next produced a table similar to the last, except that the minimnm flow at Teddington was put at 250 million gallons a day; the reservoir capacity being enlarged in consequence to 38,000 million gallons. The flow of 250 million gallons, he considered necessary on the ground that it was important the natural flow of the river should not be interfered with. From the reservoir capacity of 38,000 million gallons, there would be deductions of two reservoirs, or 4000 million gallons, as reserve for cleaning, &c., one-eighth, or 4250 million gallons, for non-available bottom capacity; and 1137 million gallons for evaporation—making a total deduction of 9387 million gallons, and leaving a net working capacity of 28,613 million gallons. The point that was brought out by comparing this table with the preceding one, was that for an increase in the flow of 50 million gallons a day, the storage had to be raised from 28,000 to 38,000 million gallons. This pointed to the fact that, when contemplating the abstraction of 300 million gallons from the Thames, they were rapidly approaching the period when they could get no more water at all. The enormous increase of storage capacity necessitated by the 50 millions of flow, was such as to show that a step or two further on they would not get more water without the enormous amount of storage to which he had alluded; the reason being that the occasions when it would be possible to pump water from the river would be diminished. With a flow of 250 million gallons, and storage of 38,000 million gallons, the daily average flow per annum at Teddington, in 1893, would have been: Natural, 992·4 million gallons; actual, 888·3 million gallons, with a resultant flow under the Staines scheme of 756·7 million gallons. During the year, there were 58 days on which the flow of the Thames at Teddington actually fell below 250 million gallons daily; there were 337 days on which the river would have been drawn on for a supply to fill the reservoirs; and there were 206 days when the flow over Teddington Weir would have been reduced to 250 million gallons. In this latter period of 206 days, the average natural flow of the River Thames was 422·5 million gallons; the maximum being 749·5 million gallons, and the minimum 252·3 million gallons. The actual flow during this same period of 206 days was, on an average, 315·3 million gallons, varying from a maximum of 650·7 million gallons to 141·3 million gallons. The rainfall for the year was 22·08 inches. All through, he calculated on the assumption that the reservoirs were full at the commencement of the year. The horse power of the pumps he put at 1775, which would enable 225 million gallons to be lifted into the reservoirs every 24 hours. He had considered the cost of these schemes on the basis of the conditions he had stated. Asked what he considered would be the cost of bringing a daily supply of 165 million gallons, with a minimum flow of 200 million gallons at Teddington, and excluding floods above 2300 million gallons for fifteen days, witness replied that for reservoirs and what he might call head works, pumping machinery, and bringing water down to the existing pumping works of the Companies at Molesey, the cost would be £1,950,920. He put the cost of the net storage capacity at £380 per million gallons. He explained the difference between this figure and the one Mr. Deacon gave (which was lower), by saying Mr. Deacon made his estimate in a slightly different way. The cost of pumping into reservoirs at Staines, witness put at 5s. per million gallons, which, on 7924 million gallons—the quantity actually pumped in 1893—worked out to £1981. This sum, capitalized at 30 years, equalled £59,430. The distribution of 35 million gallons per day equalled 12,775 million gallons per annum, the cost of which, at £2 10s. per million gallons, equalled £31,937, which, capitalized at 30 years, totalled £958,125. These three figures of £1,950,920, £59,430, and £958,125, totalled £2,968,475. He had given the Companies credit in this estimate for a storage of 866 million gallons already existing. This estimate included nothing for the capital cost of engines and accessories to pump the 35 million gallons a day, for distribution; but according to the figures of Messrs. Hunter and Fraser, £249,615 should be added on this account. His next estimate was framed on the assumption that they had to deal with a daily supply of 130 million gallons, *plus* 35 million gallons the first instalment of the Staines scheme, and *plus* 20½ million gallons the quantity recently granted by the House of Commons to the Southwark and Vauxhall Water Company—giving a total of 185½ million gallons, or 55½ million gallons more than was actually supplied now from the Thames. Further, he assumed that the minimum flow at Teddington was to be 200 million gallons daily, and that floods exceeding 2300 million gallons for fifteen days, on the flow of the river for 1893, were to be rejected. The storage required would be 8000 million gallons, which, less existing capacity of 866 million gallons, left the 7134 million gallons of storage to be supplied. This, at £380 per million gallons, equalled £2,710,920. The annual pumping into reservoirs on the 1893 basis would be 10,556 million gallons, which, at 5s. per million gallons, equalled £2639. This sum, capitalized at 30 years, came to £79,170. The cost of distributing 55½ million gallons per day, or, in the year 20,257½ million gallons at £2 10s. per million gallons, would be £50,644; and this sum, capitalized at 30 years, equalled £1,519,320. These three figures of £2,710,920, £79,170, and £1,519,320 gave a total of £4,309,410, *plus* (as before) £395,775 for capital cost of accessories and engines to pump the 55½ million gallons for distribution, brought out the final total of £4,705,185. He had prepared an estimate for this 185½ million gallons per day, on the assumption that the flow over Teddington Weir was to be not less than 250 million gallons, instead of 200 million gallons a day. The total reservoir capacity required would be 16,000 million gallons, or, deducting 866 million gallons existing storage, 15,134 million gallons, which, at £350 per million gallons, would cost £5,296,900. The pumping would extend to 16,584 million gallons, which, at 5s. per million gallons. produced £4146, or, capitalizing this sum at 30 years' purchase, £124,380. These two sums—with the £1,519,320 as in the preceding estimate—came to £6,940,600. Adding, as before, £395,775 for increased pumping power, gave the final figure of £7,336,375. Witness next gave his estimate for a supply of 300 million gallons per day on the basis of a minimum daily flow over Teddington Weir of 200 million gallons; the river being taken as in 1893, and excluding floods exceeding 2300 million gallons a day for fifteen days. The storage capacity required would be 28,000 million gallons, or, less existing capacity of 866 million gallons, 27,134 million gallons, which, at £350 per million gallons, would cost £9,496,900. The pumping required in the year would be for 30,273 million gallons, which, at 5s. per million gallons, would give £7568. This sum, capitalized at 30 years, equalled £227,040. The distributing of 170 million gallons daily, or 62,050 million gallons per annum, at £2 10s. per million gallons, equalled £155,125, which, capitalized at 30 years amounted to £4,653,750. These three figures of £9,496,900, £227,040, and £4,653,750, totalled £14,377,690, which, with £1,212,300 for pumping-engines necessary for distributing, brought out the final figure of £15,589,990. In all these cases, he explained, the flow of the river was taken as in 1893; it being necessary to provide storage for a dry year. The last estimate was on the same basis as the preceding one, except that the flow over Teddington Weir was taken as 250 million gallons. The total storage capacity required would be 38,000 million gallons, or, less the existing storage, 37,134 million gallons, which, at £320 per million gallons, worked out to £11,882,880. Pumping would be required in the year for 38,802 million gallons, which, at 5s. per million gallons, would cost £9700; or, capitalizing this sum at 30 years, £291,015. To distribute the 170 million gallons daily, or 62,050 million gallons per annum, would require, at £2 10s. per million gallons, £155,125, which, capitalized at 30 years, gave a figure of £4,653,750—making, with the £11,882,880 and £291,015, £16,827,645. Adding to this the same figure as Messrs. Hunter and Fraser gave—£1,212,300—for extra engine power for distribution, the total of £18,039,945 was arrived at. Witness pointed out that, as the amount of storage capacity increased, the cost per million gallons for construction decreased. The first cost of the reservoirs, which he had taken at £320, would bring the water from the reservoir at Staines to the Companies' reservoirs, but would not cover the cost of laying the pipes.

Major-General Scott: This estimate which you have given of the cost of supplying under reservoir conditions 185½ million gallons a day, which is the limit which the County Council approves of as safe, represents what, in the opinion of the London County Council, should be expended if they took over the works, in order to bring the addition of the water supply from the Thames into a satisfactory state?

Witness: That is so.

In further cross-examination, witness said the figures he had given in the estimates were the expenditure which the Council, if they took over the undertakings, would have to face, whether they continued the Staines scheme or went to Wales. The Companies, he thought, would have to face it too, if they were not purchased. If the 300 million gallons daily were brought in on the basis of the flow of 250 million gallons at Teddington Weir, the cost would practically double the capital of the Companies. If the Council were to purchase the undertakings to-morrow, he should advise them to go to Wales at once and commence the Yrfon and Towey schemes, which, with the works as he should construct them, he estimated would cost £14,112,000. This supply would last till 1931.

Major-General Scott: Then you must begin another instalment, so as to have that ready by 1931. When would you begin this second instalment?

Witness: That I can hardly say. It would mean the construction of another reservoir only, and an addition to the filters.

Witness's examination had not concluded when the Commission adjourned till yesterday, the 23rd inst.

The twenty-third sitting of the Commission was held yesterday, at the Westminster Town Hall—Lord Llandaff presiding, and all the Commissioners being present except Sir J. Dorington and Mr. Cripps. Sir Alex. Binnie gave further evidence regarding the Staines scheme, and the slightly extra cost which would have to be incurred beyond his previous estimates on account of the Companies being unable always to convey the water from the Thames to the filter-beds direct, owing to its impurity at certain times; this fact necessitating some additional provision in the way of storage.

WEST MIDDLESEX WATER-WORKS COMPANY.

The Half-Yearly General Meeting of this Company was held last Tuesday, at the Office, Marylebone Road—Mr. E. Boulnois, M.P., in the chair.

The Secretary (Mr. F. H. Wybroo) read the notice calling the meeting, and afterwards the report of the Company's Auditors, which stated that the capital was the same as last half year—namely, £1,641,863—and that the expenditure on the works had amounted to £1,629,011, including £37,244 expended in the past half year. The revenue for the half year ended Lady-day last showed an increase of £3479 on that of the corresponding period of last year; having amounted to £135,705, as against £132,226. The water-rental received during the six months to March 31 last, was £123,639; and the balance to the credit of the dividend and interest account was £63,323.

The Chairman, in moving the adoption of the report and accounts, stated that since their last meeting they had had to deplore the loss of two of their colleagues—Sir W. H. Wyatt and Baron Dimsdale. At a previous meeting of the proprietors, when the former gentleman resigned the

chairmanship, his long services were recognized by the proprietors, and were fully alluded to in the report. Sir William Wyatt continued his attendance as a member of the Board long afterwards; and, indeed, he was constantly among them until within a few weeks of his death. Like his predecessor in the chair, Major Boileau, Sir William Wyatt was a great master of detail; and he thought he might safely say that there was no man in the water world who knew more about water and the bearing of the question generally than did Sir William. Their other colleague, Baron Dimsdale, might be said practically to have died in harness; being only away from one or two meetings before his death. He was a man who took a great deal of interest in all questions affecting the Company; and during his prime, and when a member of the House of Commons, Baron Dimsdale was of great assistance to the Company in matters affecting them which came before Parliament. The report informed them that great progress had been made with the construction of the new filter-beds at Barnes; one being nearly completed, and the other two well advanced. They would, he hoped, be finished almost immediately. Their great reservoir and filter powers now put them comparatively at ease; and it would be a satisfaction to the proprietors to know that, notwithstanding the long drought which had overtaken the country, and which apparently had not yet come to an end, the Company would not, in the opinion of their Engineer, be seriously affected. The water taken from the river was ample at present; and with their great storage, he thought they might be satisfied that, even if the drought continued, they would be able to give an ample supply to their consumers during the summer. The whole of the district supplied by them in the Metropolitan area was now under the constant system; and the report alluded to the fact that it seemed likely they would have to extend the system ultimately to part, if not the whole, of the outer area—an application having been made to them on the subject by the Middlesex County Council. As far as the Metropolitan area was concerned, they were glad this work had been accomplished; but it had been an intricate and troublesome business, extending over some time. He thought it spoke well for the Company's servants that so very little friction had arisen between them and the consumers in connection with the making of the necessary alterations in the fittings. The proprietors were also informed that the Royal Commission on London Water Supply had held, up to the date of the report, twenty sittings for the reception of evidence; and he expected the Commission would have to meet as many times more before they concluded their work. He observed that the Progressives of the London County Council had not thought it unbecoming to make a rude attack on the Commission. The Chairman of the Water Committee (Mr. Dickinson), in a speech which he made to the Council two or three weeks ago, said the Commission was absolutely valueless. These were strong words to use with regard to any tribunal set up by Parliament; but it was patent to anyone who had taken any interest in the proceedings before the Commission, that things were not going quite so well for the County Council as the latter had thought. The Water Companies had been attacked by the Council over and over again. But he was glad to say that these attacks had been as often repelled; and now that an impartial and disinterested tribunal was sitting to inquire into facts and figures which had never been made the subject of investigation and examination before, the County Council turned round and said it was a useless Commission, and that their report, when it came out, would be absolutely valueless. He certainly was rather amused at Mr. Dickinson's wail about the expenditure the County Council had had to incur in retaining Counsel; and he said the Companies were also obliged to spend hundreds and hundreds of pounds. He supposed Mr. Dickinson forgot that he and his colleagues on the Council had put the Water Companies to enormous expense in the way of Counsel by their attacks in times gone by. He did not know that it was any part of the business of the Water Companies before the Royal Commission to refute the proposition that the purchase of the undertakings would be beneficial to the consumers and ratepayers. They knew very well that in the case of their own Company it would not be beneficial to the ratepayers, because the latter would lose the 10 per cent. rebate which the Company gave them. At all events, as far as the Commission were concerned, they would continue to supply any information and details which they believed might be of use in enabling them to come to a decision upon the important matter which they had undertaken by the direction of Parliament. He thought it was evident to everyone that the Commission were taking enormous pains and trouble over the inquiry; and the Water Companies would calmly and confidently await the result of their deliberations, in the full assurance that they had a very good case, and that they had nothing whatever to conceal. As Chairman of the Staines Reservoirs Joint Committee, he had the satisfaction to inform them that they had now commenced work at Staines on the two magnificent reservoirs which they were proposing to make. This was the first instalment of a great undertaking, which he thought—and others thought with him—would have a far-reaching bearing and effect upon the future of the Water Companies. He had the privilege of turning the first sod the other day for the two reservoirs, which when completed would hold no less than 3300 million gallons of water; and he supposed that they would be the largest reservoirs known to water engineers in this country. He believed that later on some of the other Companies might desire to come into the scheme. If so, the problem of the London Water Question would, in his judgment, be settled for at least half a century. Unless, and until, it was proved to the contrary, they had at their very doors a copious stream of water; and it would seem a wasteful proceeding to go 100 or 150 miles away for what experts, who had examined closely into the question, said would be a no better supply. He could assure the proprietors that their property was in a good and sound condition, and well maintained—indeed, it was kept at the highest pitch of efficiency. Their interests during the past half year had been very carefully watched over by the Directors, whose efforts had been backed by a thoroughly efficient staff—a staff of which they had every reason to be proud. To the vigilance of the Secretary, and to the ability and zeal of the Engineer, a large amount of recognition was due; and he could only state that he was glad of a public opportunity of saying how highly the Directors appreciated the services of these officers. A sum of £5000 had been transferred to the reserve fund in part replacement of the £20,000 which was transferred from the fund under a resolution of the general meeting of proprietors on Nov. 19, 1895. The £20,000 was taken from the reserve in consequence of their having to expend a very large sum on their mains, owing to the effects of the great frost. He hoped that they would be able every half year to have a surplus which would enable them to transfer something to the reserve fund, though perhaps not as much as £5000. It was a pleasure to the Directors to be able to put before the proprietors such an encouraging report.

The Deputy-Chairman (Mr. Jackson Hunt) seconded the motion, which was carried unanimously.

Resolutions were afterwards passed declaring a dividend on the consolidated stock for the half year ended March 31 at the rate of 10 per cent. per annum, payable, less income-tax, on and after July 5 next; re-electing the retiring Directors (Messrs. James Pomeroy, H. W. Prescott, and Edward Cumberlege) and the Auditors (Mr. George Pitt and Mr. F. E. Bodkin); and thanking the Auditors for their careful examination of the accounts, and the Chairman and Directors for their diligent attention to the business.

The meeting was then made special, when a resolution was passed appointing Mr. William Whitworth a Director in the room of the late Sir W. H. Wyatt.

The proceedings then terminated.

LAMBETH WATER-WORKS COMPANY.

The Directors' Half-Yearly Report.

In their report on the working of this Company during the six months ending March 31 last, the Directors state that the revenue account exhibits an increase of £5270 in the water-rents, &c., and a decrease of £1172 in the expenditure, as compared with the corresponding period of 1896-7. The principal decreases occur under the heads of distribution (£1130) and filtration (£1062). Increases occur under various heads, amounting to £1368. The largest item relates to expenses in connection with the Royal Commission now sitting; and the remainder is chiefly due to the continued growth of the Company's business. The payment to the Chamberlain of the City of London, on account of the sinking fund, is £386 more than last year, owing to the increased profits. The surplus transferred from revenue account to dividend and interest account is £80,255. There is to the credit of the latter account, after payment of interest on debenture stock, an available balance of £79,491. This amount would admit of a payment on account of arrears of dividend. Having regard, however, to the desirability of maintaining as far as possible a uniform rate, the Directors have decided to transfer £6000 to the contingency fund (which will then stand at £15,000), and to recommend that the maximum dividend of 7½ per cent. per annum be paid on the shares issued under the Company's Act of 1856; that the maximum dividend of 10 per cent. per annum be paid on all the other share capital. These dividends will amount to £67,422; and a balance of £3884 will remain to be carried forward, after making provision for the payment to the Chamberlain referred to below. Assuming the dividends are declared as recommended, a payment of £2184 11s. 8d. will have to be made to the Chamberlain under the sinking-fund clause of the Company's Act of 1886 in respect of debenture stock issued under that Act. The total sum already paid to the Chamberlain of London, exclusive of dividends on the shares he has purchased, is £8823; and he is now registered holder of 32 10 per cent. shares in the Company.

BIRMINGHAM CORPORATION WATER SUPPLY.

The Annual Report—Progress of the Elan Valley Works.

At a Special Meeting of the Birmingham City Council last Tuesday, the Water Committee submitted their annual report, of which a notice has already appeared.

Alderman Lawley Parker, in moving the adoption of the report, said the increase of £12,017 in the water-rental during the past year was equal to a 6 per cent. advance, whereas the estimate with which they went to Parliament for their Bill was based upon a 3 per cent. increase. The Council must not expect that the recent rate of increase would be maintained; but they might fairly look forward, he thought, to the rate of increase being greater than was estimated when they went to Parliament. They had now reached the rental which it was estimated they would arrive at in 1900. They would get something more from the house-to-house inspection which was being instituted. The profit for the year amounted to £28,654, against £25,812 in 1897. No doubt the greater part of the improvement was due to the fact that their capital expenditure on the new works had been at a slower rate than was anticipated. As to local works, they had expended during the year £9000 in providing extensions of the Aston works and in connection with the Perry sinking. It was necessary to go there for the water; but they had to pay a very large sum for it. They had been able to effect some further economies in connection with the consumption of water. Though there had been an increase of 60,000 in the population in the area of supply during the past four years, there had been no increase in the total amount of water consumed, thanks to the accumulated savings in connection with the department, and the economy exercised by users. This had been done without any restriction of the supply for domestic or sanitary purposes. But the department had now reached the limits of its economies, and would have to depend on consumers to prevent waste at their own houses, inasmuch as the Committee would be sorely put to it during the next five years to supply the water for which there was a legitimate demand. They had no further local sources of supply to which they could go. The Perry sinking had disappointed them; and they would be sorely put to it for the five years to come. Steady progress had been made with the Elan works during the year, particularly on the submerged dam. It was creditable to the Engineers that the two tunnels (each over 2 miles in length) which had been pierced, had come out exactly in the right place. There was a difference of only half-an-inch in the one direction, and perfect accuracy in the other; and when they considered the enormous difficulty of getting levels over mountains with great undulations, and then sinking a shaft 120 yards deep, they would have some idea of the skill and care required. They had now on tender another length of 14½ miles of conduit, which included the Teme Valley syphon. This, in itself, would require something like 14,000 tons of iron pipes. When it was undertaken, there would

be 51 out of 73½ miles of conduit in progress. They had let a contract for 6000 or 7000 tons of steel pipes (for use in the valleys, where the pressure was heaviest) to a Birmingham firm. It was a satisfaction to the Committee that they were able to place the contract locally, because there were other contractors in the field; and among them an American firm. Happily there was a wide difference in the prices; and they were able to accept the Birmingham tender with a clear conscience. He was sorry to say that two contracts had been let since 1896 at prices in excess of the parliamentary estimates. The explanation was to be found in the increased cost of labour and material, particularly in iron, steel, and cement, which formed a very large item in the cost of construction. In the Elan Valley there was another adverse factor. The stone for the dams must be of particularly good quality; and when the Corporation went to Parliament with their scheme the geologists predicted that suitable stone would be found in or near the site of each of the dams, and that there would be a good foundation in each case. He was sorry to say these predictions had not proved correct. Only in the case of the Caban dam was the stone of the high quality that was needed; and as a result stone had to be taken by rail to all the other dams. For the same reason, the foundations of the dams were not as strong as could be wished; and the dams had to be taken down lower than was originally proposed. To set off against the increased outlay thus involved, there was the augmented water-rental, and such sums as they could obtain for their old pumping-stations, for which he had reason to believe they would have customers. He did not think there was any ground for alarm as to the financial position. Personally, he believed, they were little, if any, nearer to the scheme being a charge on the rates. At the same time, he and his colleagues on the Committee felt that as they were now of opinion the estimates would be exceeded, it was right that they should tell the Council so.

Mr. Jones seconded the motion.

Mr. S. Lloyd called attention to the fact that in 1891 the total quantity of water distributed was 6141 million gallons, and the water-rates amounted to £134,549; while in 1897-8 5889 million gallons were supplied, and the water-rates amounted to £210,920. The consumers were being charged £76,326 more, and yet they were using less water.

Mr. Lane also commented on the manner in which the Committee had heaped up this revenue, while the consumption remained stationary.

Mr. Murry pointed out that, while there had been a decrease of 7 per cent. from unmeasured trade supplies, there had been an increase of nearly 14 per cent. from measured supplies. There was obviously a need for stricter supervision of the unmeasured supplies.

Alderman Parker, in reply, admitted that there had been in the past a very lax method of measuring the water. This had been rectified; and now they knew exactly the consumption. They were already putting in meters for what had been regarded as unmeasured trade supplies.

The motion was adopted.

PORTSMOUTH WATER COMPANY.

At the Half-Yearly Meeting of the above-named Company next Thursday, the Directors will report an available balance of £21,151 on he profit and loss account, out of which they will recommend the payment of the full statutory dividends; leaving £6335 to be carried forward. During the half year ending March 31 last, 2529 yards of additional street service-mains were laid in new roads; making a total of about 46 miles of trunk mains and 122 miles of service-mains. The number of additional services connected with the mains during the half year was 410; making the total number of premises now under supply by the Company in all the districts 37,945. The quantity of water pumped from Havant and Bedhampton during the period covered by the report was 1,187,004,000 gallons, or an average daily supply for all purposes of 6,522,000 gallons; being a decrease of 132,000 gallons daily, as compared with the corresponding period of last year. The quantity supplied for domestic use is equal to an average of 27 gallons per diem per head of the population, exclusive of all supplies by meter. The Provisional Order empowering the Company to raise additional capital and for other purposes, which has been approved by the shareholders, has been the subject of negotiations with the Corporation of Portsmouth and the Board of Trade; and some important amendments in and additions to the Order have been agreed to. As the result, all opposition on the part of the Corporation has been withdrawn. With a view to safeguarding the sources of supply from all possibility, however improbable and remote, of contamination, the Directors have purchased, since their previous report, nine cottages at Havant, and about 200 acres of land at Farlington, in close contact with their Farlington springs and the reservoirs on Portsdown Hill; and they have further purchased certain premises, in immediate contiguity to the Company's Havant and Bedhampton works, together with about 10½ acres of land adjoining. They have presented a memorial to the Local Government Board in reference to the drainage of Havant, with a view of protecting the sources of supply. The Corporation of Portsmouth have also sent one, supporting the Company's application.

CAPE TOWN DISTRICT WATER COMPANY.

Projected Purchase of the Works by the Local Authorities.

The question of the proposed expropriation of the Cape Town District Water-Works Company has of late received a considerable amount of attention; and the Cape papers devote a good deal of space to its discussion. The Company, which was formed in 1889, have their registered office in London. Their object is the supply of water to the suburbs of Cape Town; the capital itself having a municipal supply. A concession of twenty years was obtained from the Municipalities of Claremont and Woodstock, under which not only those towns but a wide area, including also the Municipalities of Rondebosch and Mowbray, is served. Altogether, there is a total length of 65 miles of mains. The principal sources of supply are the Albion spring, which has a capacity of 1½ million gallons per day, and the Kommetje spring; the latter being at the greater elevation, and yielding sufficient in the winter to enable the supply to be maintained with an intermittent use of the pumps connected with the Albion springs. The plant comprises two Worthington horizontal pumps and two large boilers. Under the terms of the concession, the Municipalities of Claremont and Woodstock have the right, singly or collectively, of taking over the concern at the end of ten years; and this period will expire on Jan. 1, 1899. A meeting of the ratepayers of Claremont has already passed a resolution approving of the principle that the Municipality should, if possible, own the water-works. There is, however, a good deal to be settled in the way of detail before such a resolution can be acted upon. A preliminary difficulty of some importance has been overcome by an admission of the Company. The wording of the clause under which the Municipalities have the right of expropriation is somewhat vague; and it admitted of the interpretation that, at the end of ten years, twelve months' notice might be given to terminate the concession. However, the Company have waived this point; and it is agreed that the date on which the property shall be handed over, if at all, is Jan. 1, 1899. A more important matter is that of the position of the four Municipalities in the area of supply. Whether the other two Councils shall be permitted to join with Claremont and Woodstock in the acquisition of the undertaking, and, if so, upon what terms, are questions which have to be determined. Geographically, Rondebosch and Mowbray occupy a central position between the other two towns; and the Albion spring actually rises in Rondebosch. Under these circumstances, they are likely to insist upon having a voice in the final decision. Indeed, it is doubtful whether the other two Municipalities, even if they desired it, could obtain parliamentary powers which would exclude these places from participation in the ownership of the undertaking.

The next and final consideration is one of finance. The undertaking has had many difficulties to contend with in its brief career, and has only in the last year or two given promise of a satisfactory return to the shareholders. Of the nominal capital of £100,000, the amount subscribed is £80,000. In addition there have been two debenture issues—one of £50,000 and the second of £20,000. It was not until 1892 that any profit at all was made. In that year there was a small credit balance of £100, which was increased in 1893 to £500. Since then the affairs of the Company have been more prosperous, and the profits of successive years have been as follows: 1894, £2000; 1895, £5000; 1896, £4000; 1897, £6000. No dividend at all was paid for the first five years; and until last year the return upon the capital was very small. The first dividend paid, in 1894, was only 1 per cent.; and this was followed in 1895 by one of 3 per cent., in 1896 by 3½ per cent., and in 1897 by 6 per cent. At present the position of the Company is fairly satisfactory. From the last balance-sheet, which is for the year ended June 30 last, it appears that the revenue for the sale of water advanced from £10,653 in the previous year to £14,944—showing an increase of £4290; while extensions involving a capital expenditure of £2763 on new mains had been made under guarantees as regards revenue. The net profit of the year was £6013, which with £924 brought forward made a total credit of £6937. A dividend of 6 per cent. absorbed £4800; and of the balance, £800 was placed to the reserve fund, and £1337 carried forward. The actual profit earned last year was nearly £10,000—being a net profit of £6013; and a payment of the interest on debentures of £3873. The assets of the Company amount to £155,000, of which £145,842 represents the cost of the property and the amount expended on construction.

A question of considerable importance is that of the extension of the works and mains. Under their contract, the Company are to supply 200,000 gallons of water per day to Claremont, a like quantity to Woodstock, 150,000 gallons each to Rondebosch and Mowbray, and 100,000 gallons to the Government railway department—a total of 800,000 gallons. After allowing for compensation, it is said that there is not much margin between the yield of the springs and the quantity delivered, and that with the rapid growth of the suburbs of Cape Town the supply will be inadequate in a few years. Whether the works continue in the possession of the Company or are transferred to the Municipalities, extensive developments must be taken in hand. At present this matter is in abeyance because of the uncertainty with reference to the future; while outlying portions of the district, situated beyond the limit of 400 yards from the mains, which is the measure of the Company's responsibility to supply, are unable to obtain water. The charge for water is £2 per 100 gallons in Woodstock, where it is supplied in bulk to the Municipal Authority; and £2 10s. in the other districts, where the Company collect the rental.

A poll of the ratepayers of Claremont was taken on the question on the 14th ult., and decided in favour of the purchase by 195 votes to 10—a majority of 185. On the same day, a public meeting was held at Woodstock, at which a resolution was unanimously passed giving the Town Council power to proceed with the purchase of the undertaking jointly with Claremont, and, if they thought it desirable, to admit Rondebosch and Mowbray as partners in it, on such terms as they deemed advisable. In the course of the discussion at this meeting, the Mayor (Mr. G. C. Behr) said the Company had suggested that the sum of £500,000 should be put in the Bill as the capital of the concern, to include the necessary alterations and extensions. Objection was taken that the revenue would not for many years suffice to pay the interest on £500,000; and it was suggested that for less than this a very much better supply could be obtained from another source. It was, however, pointed out that the mention of £500,000 would not compel them to spend so much; and eventually the opposition was withdrawn on the understanding that the Council would take expert advice on the matter.

Stockton and Middlesbrough Water Board.—A summary of the half-yearly accounts of the Stockton and Middlesbrough Water Board has been issued. It shows that the capital expenditure in the six months amounted to £21,637; making the total cost of the undertaking £1,839,181. The principal items were on account of Hury reservoir, £5000; Lartington tank and filter-beds, £12,450; and extension of mains, £1396. The sum of £23,633 was received on capital account; making the total £1,826,802. The income was £36,711—a decrease of £36 on the preceding half year, and an increase of £174 on the corresponding period of the previous year. The expenditure showed decreases of £352 and £458 respectively. The balance was £29,030, which, including £23,753 from the previous half year, and making allowances for interest received and paid, gave a balance of £52,877. Of this, £42,000 had been paid to the Corporations during the half year.

NOTES FROM SCOTLAND.

From Our Own Correspondent.

Saturday.

The great event of this week, which needs not to be named, has so diverted the thoughts and the speech of people from the ordinary affairs of life, that it is with difficulty I can lay my hands on material out of which to make "Notes."

The Town Council of Aberdeen have not yet "come to their senses," as the phrase is in Scotland, in the matter of opposition to the Bill of the Great North of Scotland Railway Company. They took three hours yesterday to consider whether or not they should oppose the Bill in the House of Commons; and by 20 votes to 7, they resolved to continue the opposition. But, by what I can only describe as a peculiarly Aberdonian method of doing business, they have also resolved "to again communicate with the Railway Company, with a view to compromise." This shows the weakness of the Corporation case as well as anything else could. There is not much fight in the man who, while taking off his coat, announces that he is prepared for a friendly settlement of the cause in dispute. The Convener of the Gas Committee, who moved that the opposition be continued, contended that the decision of the Lords' Committee was unjust, in respect that it gave the Corporation less than the Railway Company had offered. To avoid the appearance of injustice in this column, I give the Corporation view of the situation in their own words, in a document which has been printed and circulated among the members of the Council, in which it is stated that: "The portion of the gas-works for which compulsory powers of purchase were sought by the Bill extends to 687 square yards. The area of public streets which the Railway Company propose to appropriate is 4369 square yards, in addition to which they propose to appropriate a triangular area, at the junction of Garvock Street and St. Clement's Street, of 794 yards. The area required from the Railway Company for carrying out the widening of Castle Terrace and Miller Street, would have been 1253 square yards. The ground coloured red on the Burgh Surveyor's sketch, dated April 23 [the ground referred to in the Burgh Surveyor's memorandum, to be ceded by the Town Council to the Railway Company], measures 435 yards; while the ground coloured green [the area to be handed over by the Railway Company to the Town Council, under the memorandum] measures 1171 square yards. The last-mentioned piece of ground is burdened with feu-duties which amount to about £17 10s. per annum; while the ground belonging to the gas-works, and which is coloured red, is free of feu-duty. The existing and proposed gradients of the streets to be interfered with under the Bill are as follows: Miller Street—Existing gradient, 1 in 32; proposed gradient, 1 in 20. Cotton Street—Existing gradient, 1 in 60; proposed gradient, 1 in 20. Fish Street—Existing gradient, 1 in 17; proposed gradient, 1 in 10." The local print from which I take this quotation adds: "It may be necessary to point out that the ground proposed under the Burgh Surveyor's memorandum to be ceded by the Railway Company to the Council, on which there is a burden of feu-duty, is not the ground to be ceded under the decision of the House of Lords Committee. No feu-duty attaches to that piece of ground." So this extraordinary Sub-Committee, who have charge of the business, are out of court at home as well as everywhere else. I daresay what is at the bottom of the whole matter is that the Corporation wish to have a public improvement effected at the cost of the Railway Company; and, what is not unusual, believe that they are justified in doing so. This is a spirit which should be combated wherever it is found to exist. An individual may make a bargain for profit; but a public body, particularly a Town Council, have no business to make profits—their duty is to do justly by all men. In this instance, the Corporation appear desirous of obtaining benefit for the general body of ratepayers at the expense of one constituent, who is probably the largest they have—the Railway Company. Their attitude is, to say the least of it, not dignified.

The Stirling Town Council are getting further into the mire in the matter of their opposition to the Bill of the Stirling Gaslight Company. Not content with the opposition to the present Bill, those who came into the Council last November—representatives of the party who defeated last year's Bill proposing a transfer—have, after much threatening, brought forward a proposal which is, in effect, that the costs of last year's Bill should be defrayed by those who, in the Corporation, promoted the proposed transfer. The expenses amounted to £3767; and they have been paid out of the Common Good fund of the burgh. The proposals of the recalcitrants are contained in the following letter, which was addressed by three members of the Town Council to the Treasurer, as Convener of a Committee on the Burgh Funds, and which the Committee laid before a meeting of the Council this week:—

Referring to the discussion at Committee meeting last week, we wish to let you know that in our opinion (which we believe is also that of a very large section of Stirling people), it was wrong and illegal to borrow on the credit of the Common Good for payment of the expenses incurred by Police Commissioners last year in connection with the Gas-Works Purchase Bill; and loyalty to the interests of the burgh, as well as a proper regard for its fair fame, impel us to insist that the soundness of this opinion should be judicially determined. It is our earnest wish that, in settling this question, all personal feeling should be avoided; and that the answer should be given by an authority at once decisive and impartial.

We have therefore resolved to propose to you, and through you to those of the twelve gentlemen by whose votes these expenses were incurred, and who are still members of the Town Council, that you should join us, and any other councillors who concur, in instructing a special case for the Court of Session on the subject. The statement of facts might be prepared by Mr. Galbraith and Mr. Robb; and the points which the Court should be asked to decide are these three:—

1.—Is it competent that the Common Good of the burgh should be made liable for any such expense?
2.—Were the accounts properly taxed as well as audited, in view of the provisions of the Long Act?
3.—On whom did the liability for the Gas Bill and the Limited Reference Expenses devolve?

The decision of the Court would be satisfactory to us, and would no doubt be acquiesced in by all concerned, and would clear away the uncertainty and suspicion that now exist. If you and the councillors associated with you decline this proposal, then we have another to make, although we cannot regard it as so complete and satisfactory. It is, that you, and

GAS AND WATER COMPANIES STOCK AND SHARE LIST.

Referred to on p. 1183.

Issue.	Share.	When ex Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p. c.	GAS COMPANIES.			£ s. d.
590,000	10	Apl. 15	10½	Alliance & Dublin 10 p. c.	23½–24½	..	4 5 9
100,000	10	"	7½	Do. 7 p. c.	16–17	..	4 8 3
300,000	100	Jan. 3	5	Australian 5 p. c. Db.	105–107	..	4 13 6
200,000	5	Nov. 11	6†	Bombay, Ltd.	5⅞–6¼	..	4 16 0
40,000	5	"	6†	Do. New, £4 paid	4⅞–5¼	..	4 11 5
380,000	Stk.	Feb. 21	12	Brentford Consolidated	290–295	..	4 1 4
240,000	"	"	9	Do. New	215–220	..	4 1 10
50,000	"	"	5	Do. 5 p. c. Prf.	140–145	..	3 9 0
159,375	"	Dec. 15	4	Do. 4 p. c. Db. Stk.	134–138	..	2 18 0
220,000	Stk.	Mar. 30	11½	Brighton & Hove Orig.	270–275	..	4 3 8
218,820	"	"	8½	Do. A. Ord. Stk.	195–200	..	4 5 0
933,500	Stk.	Feb. 24	5	Bristol, 5 p. c. max.	127–132	..	3 15 9
420,000	20	Ma. 30	11½	British	55–56	..	4 0 4
50,000	10	Mar. 11	11½	Bromley, Ord. 10 p. c.	25–27	..	4 5 2
75,000	10	"	8½	Do. 7 p. c.	20–22	..	3 17 3
500,000	10	Apl. 29	6	Buenos Ayres (New) Ltd	8¾–9¼	..	6 9 9
98,122	Stk.	Dec. 30	4	Do. 4 p. c. Db. Stk.	98–100	..	4 0 0
150,000	20	Mar. 11	8½	Cagliari, Ltd.	30½–31½	..	5 4 9
100,000	10	Sep. 30	8	Cape Town & Dis., Ltd.	16–17	..	4 14 2
50,000	50	May 3	6	Do. 6 p. c. 1st Mort.	58–60	..	5 0 0
550,000	Stk.	Apl 15	13½	Commercial Old Stock	323–328	..	4 2 4
200,750	"	"	10½	Do. New do.	250–255	..	4 2 4
200,750	"	Dec. 15	4½	Do. 4½ p. c. Db. do.	150–155	..	2 18 1
800,000	Stk.	Dec. 15	12	Continental Union, Ltd.	210–220	–5	5 9 1
200,000	"	"	9	Do. 7 p. c. Prf.	195–205	..	4 7 10
51,600	Stk	Feb. 24	14	Croydon A 10 p. c.	310–315	..	4 8 11
168,400	"	"	11	Do. B 7 p. c.	255–265	..	4 3 0
535,000	Stk.	Feb. 24	5½	Crystal Palace Ord. 5 p. c.	128–133	..	3 18 11
60,000	"	"	5	Do. 5 p. c. Prf.	142–145	..	3 9 0
486,090	10	Jan. 27	11	European, Ltd.	23½–24½	..	4 9 9
354,060	10	"	11	Do. £7 10s. paid	17–18	..	4 11 9
5,922,110	Stk.	Feb. 10	12½	Gaslight & Coke, A, Ord.	292–297	+5	4 5 9
100,000	"	"	4	Do. B, 4 p. c. max.	118–123	..	3 5 1
665,000	"	"	10	Do. C, D, E, 10 p. c. Prf.	300–305	..	3 5 7
30,000	"	"	5	Do. F, 5 p. c. Prf.	150–155	..	3 4 6
60,000	"	"	7½	Do. G, 7½ p. c. do.	220–225	..	3 6 8
1,300,000	"	"	7	Do. H, 7 p. c. max.	195–200	..	3 10 0
463,000	"	"	10	Do. J, 10 p. c. Prf.	300–305	..	3 5 7
476,000	"	"	6	Do. K, 6 p. c. Prf.	178–183	..	3 5 7
1,061,150	"	Dec. 15	4	Do. 4 p. c. Db. Stk.	132–135	..	2 19 3
294,850	"	"	4½	Do. 4½ p. c. do.	150–155	..	2 18 1
958,000	"	"	6	Do. 6 p. c. do.	200–205	–2	2 18 6
70,000	10	May 12	8	Hongkong & China, Ltd.	13½–14½*	..	5 10 4
3,900,000	Stk.	"	10	Imperial Continental	207–212	–3	4 14 4
376,400	100	Feb. 1	4	Do. 4 p. c. Dbs. Red.	98–101	..	3 19 3
473,600	Stk.	Feb. 10	3½	Do. 3½ p. c. Db. Stk.	103–106	..	3 6 0
560,000	100	Apl. 1	5	Met. of Melbourne 5 p. c. Db.	110–112	..	4 9 3
250,000	100	"	4½	Do. 4½ p. c. Db.	107–109	..	4 2 7
					* Ex div.		

Issue.	Share.	When ex Dividend.	Dividend or Dividend & Bonus.	NAME.	Closing Prices.	Rise or Fall in Wk.	Yield upon Investment.
£			p. c.	GAS COMPANIES.			£ s. d.
75,000	5	Dec. 15	6	Malta & Medn., Ltd.	5¼–5¾	–¼	5 4 4
541,920	20	Nov. 11	5	Monte Video, Ltd.	14½–15½	–½	6 9 0
617,946	Stk.	Feb. 24	9¾	Newc'tle & Gatesh'd Con.	235–240	..	4 1 3
252,355	Stk.	Jan. 3	3½	Do. 3½ p. c. Db. Stk.	115–120	..	2 18 4
150,000	5	Nov. 26	8	Oriental, Ltd.	8–8½	..	4 14 2
135,000	5	"	8	Do. New, £4 10s. pd.	7–7½	..	4 16 0
15,000	5	"	8	Do. do. 1879, £1 pd.	1½–2	..	4 0 0
60,000	5	Mar. 11	7	Ottoman, Ltd.	4¾–5¼	..	6 13 4
500,000	100	Dec. 1	6	People's Gas 2nd M. of Chicago Bd.	103–108	..	5 11 1
848,070	10	—	—	River Plate Ord.	9¼–9⅝	..	—
250,000	Stk.	Jan. 27	4	Do. 4 p. c. Db. Stk.	98–100	–1	4 0 0
250,000	10	Apl. 29	10	San Paulo, Ltd.	15–16	..	6 5 0
135,000	Stk.	Mar. 30	10	Sheffield A.	245–248	..	4 0 8
209,053	"	"	10	Do. B.	245–248	..	4 0 8
447,427	"	"	10	Do. C.	245–248	..	4 0 8
5,531,250	Stk.	Feb. 24	5½	South Metrop., 4 p.c Ord	135–138	+2	3 16 1
1,460,000	"	Jan. 13	3	Do. 3 p. c. Db. Stk.	102–105	–1	2 17 2
60,000	Stk.	Mar. 11	12	Tottenham and A.	285–295	..	4 1 4
60,000	"	"	9	Edmonton B.	205–215	..	4 3 9
182,380	10	Dec. 20	7	Tuscan, Ltd.	13–14	..	5 0 0
149,900	10	Jan. 3	5	Do. 5 p. c. Dbs. Red.	100–103	..	4 17 1
				WATER COMPANIES.			
746,164	Stk.	Dec. 30	10½	Chelsea, Ord.	320–330	..	3 3 8
150,000	"	"	5	Do. 5 p. c. Prf.	170–175	–6	2 17 2
160,000	"	"	4½	Do. 4½ p. c. Pf. Stk., 1875	150–155	–6	2 18 1
175,785	"	Mar. 30	4½	Do. 4½ p. c. Db. Stk.	158–163	..	2 15 3
1,720,560	Stk.	Apl. 15	8	East London, Ord.	225–230	..	3 9 7
654,740	"	Dec. 30	4½	Do. 4½ p. c. Db. Stk.	158–162	..	2 15 7
390,000	"	"	3	Do. 3 p. c. Db. Stk.	104–106	–1	2 16 7
700,000	50	Dec. 15	7½	G'd Junct'n, 10 p. c. max.	115–120	..	3 2 6
310,000	Stk.	Mar. 30	4	Do. 4 p. c. Db. Stk.	140–145	..	2 15 2
708,000	Stk.	Feb. 10	13	Kent	358–363	..	3 11 8
160,000	"	"	7	Do. New, 7 p. c. max.	218–218	..	3 4 3
1,043,800	100	Dec. 30	10	Lambeth, 10 p. c. max.	295–300	..	3 6 8
406,200	100	"	7½	Do. 7½ p. c. max.	228–233	..	3 4 4
350,000	Stk.	Mar. 30	4	Do. 4 p. c. Db. Stk.	140–145	..	2 15 2
500,000	100	Feb. 10	13	New River, New Shares	435–440	..	2 19 1
1,000,000	Stk.	Jan. 27	4	Do. 4 p. c. Db. Stk.	142–147	..	2 14 5
902,300	Stk.	Dec. 15	6	Southw'k & V'xhall, Ord.	155–160	..	3 15 0
126,500	100	"	6	Do. do. 7½ p. c. max.	152–157	..	3 16 5
489,200	Stk.	"	5	Do. do. 5 p. c. Prf.	170–175	–4	2 17 2
1,019,585	"	Apl. 15	4	Do. 4 p. c. A Db. Stk.	140–143	..	2 15 11
1,155,066	Stk.	Dec. 15	10	West Middlesex	300–305	..	3 5 7
200,000	"	"	4½	Do. 4½ p. c. Db. Stk.	160–165	..	2 14 7
200,000	"	Mar. 11	3	Do. 3 p. c. Db. Stk.	105–107	..	2 16 1
					* Ex div.		

† Next dividend will be at this rate.

those others by whose votes and advice these expenses were incurred, should agree to repay to the Common Good—say, within four months from this date—the £1017 incurred for "reference" expenses, and join with us in taking, say, £250 (as the proportion of expenses incurred with statutory powers) from the Police Rates, and repay the same to the Common Good. Although this would still leave the Common Good burdened with £2500 of questionable indebtedness, still we would regard burghal rights as having received a substantial recognition, and should feel, so far as we were concerned, there was a relief from the painful duty of further pressing the subject. In the event of the second proposal for an amicable settlement being also declined, we think it right to let you know that we shall feel bound to take such legal steps as we may be advised to have the rights of the burgh in the matter protected and vindicated.

This is a hot subject to handle; for, as I wrote here when it was first mentioned, there is every likelihood that those in last year's Council who were against the transfer would have to bear their share of the costs, as well as those who promoted, were it decided that the money should be refunded. Therefore the antagonists are not solid on this matter of repayment, at which there need be no wonder. The antagonists are an astute party, however; and they were not caught napping. They contrived to get the Council to divide on a side question—viz., whether consideration of this letter and of a motion relating to the same subject should be taken up together. In the division, they suffered defeat by two votes; and taking the lesson to heart, they promptly withdrew the motion of which notice had been given, with a threat that it would be brought up again. The strange thing about the whole affair is that the Committee made no recommendation on the subject, but laid the letter before the Council; and when the motion proposing that what was contained in the letter should be enacted was withdrawn, and the party were unable to carry their proposal, the Council discharged the remit and the Committee together. Thus nothing has come of the move, except that a good deal of bad feeling has been created. The Council were subsequently unanimous upon one matter connected with the expenses of opposing the present year's Bill. They resolved that the costs be defrayed, meantime, out of the equivalent grant. The determination of the question of which fund the money is ultimately to be taken from, will come up when all the expenses have been incurred.

The Forfar Gas Corporation had before them this week tenders for coal. The plea was raised that time should be allowed for consideration of the offers. Of course, there is a possibility that the price of coal may come down, when the tenders would not be accepted, but others procured. The Works Committee recommended that they should get in, and store, the undelivered balance of the current year's contracts. Forfar is one of the places where the Corporation—being, I suppose, poor hands at book-keeping—object to the Manager having a large balance of coal at the close of the financial year; and out of deference to the weak-kneed brethren in the Corporation, it was resolved not to ask delivery of this coal till after the annual stock-taking on June 16. The new contracts are to be considered next month. A discussion was raised by Mr. Christie upon what he considers to be the unsatisfactory position of the contingent fund. It seems that it is the custom of the Corporation to draw from the contingent fund to meet current expenses. They lend the fund to the Treasurer at 3 per cent.; while the bank would charge them 5½ per cent. There is thus, it will be seen, reason for the practice. But it is merely an arrangement of convenience, and can be defended on no other ground. If the Corporation could afford to keep a bank account, they would work cheaper than they do. This ought not to be difficult to attain. A few hundred pounds should be sufficient. The subject is to be considered by the Finance Committee.

A fire, involving a loss of about £25, occurred in Dundee last Saturday. The cause of it was that an electric supply wire fused, which first melted a gas-pipe and then set fire to the gas. This was either careless wiring or careless gas-fitting. What, however, I wish to direct attention to is the circumstance that very seldom nowadays is the cause of a fire given in newspaper reports. In my early journalistic days, no report of a fire was considered to be complete unless it was stated how the conflagration originated. This is scarcely ever stated now. Is the reason for this due to a desire not to damage corporation electricity departments by announcing them as the cause of some (or many) of the fires? I hesitate to make the suggestion, because I have nothing to substantiate it with, except the fact which I have mentioned, and the knowledge that it is not the newspapers who are responsible for the omission.

CURRENT SALES OF GAS PRODUCTS.

LIVERPOOL, *May* 21.

Sulphate of Ammonia.—There has again been an active market, resulting in improved values all round. Sales have been made at £9 2s. 6d. per ton f.o.b. Hull; and the closing quotations f.o.b. Liverpool and Leith are £9 6s. 3d. to £9 7s. 6d. per ton. The most urgent demand has been for "covering" sales for May delivery; but as the evidence of paucity of supplies has become clearer, consumers have come forward more freely at advancing prices, in anticipation of their autumn season's requirements. Home demand is about over in England; but in Scotland there are still requirements. In the forward position, a large business has been done, at up to £9 7s. 6d. per ton for delivery over the early autumn months, and up to £9 10s. per ton for October-March delivery, f.o.b. Leith. At the close, still higher prices are asked; but buyers seem disinclined to pay the further advance required.

Nitrate of Soda is in better demand in the forward position at increased prices; but spot value of fine quality remains at 7s. 4½d. per cwt.

LONDON, *May* 21.

Tar Products.—Mr. Livesey's letter in last week's "JOURNAL" has created quite a flutter among tar distillers. The concensus of opinion among them is that, if gas manufacturers would employ benzol to enrich gas, which it would pay them very well at the present low prices to do, tar would at once be more valuable. For fuel purposes tar is not 30 per cent. better than coal; and in consequence of its viscosity, and its intense local cutting action when burnt, and the large deposit of cokey matter it makes, it presents difficulties that few care to tackle, especially when coal and coke are obtainable at reasonable rates. After a hopeful

CARBURETTED WATER-GAS APPARATUS

Merrifield—Westcott—Pearson Patents.

The Economical Gas Apparatus Construction Co., Ld.

W. H. PEARSON, Chairman.
W. H. PEARSON, Junr., Deputy-Chairman.
J. T. WESTCOTT, M.E., Manager.
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CARBURETTED WATER-GAS ENGINEERS.

The above Company have erected since 1893, or are now erecting, their Universal Type of Carburetted Water-Gas Plant at the following Gas-Works:—

	CUBIC FEET.		CUBIC FEET.
BLACKBURN	1,250,000	TORONTO (Second Contract; Remodelled)	2,000,000
WINDSOR STREET WORKS, BIRMINGHAM	2,000,000	LINDSAY (Remodelled)	125,000
SALTLEY WORKS, BIRMINGHAM	2,000,000	MONTREAL	500,000
COLCHESTER	300,000	BELLEVILLE	250,000
BIRKENHEAD	2,250,000	OTTAWA (Second Contract)	250,000
SWINDON (New Swindon Gas Co.).	120,000	BRANTFORD (Remodelled)	200,000
SALTLEY WORKS, BIRMINGHAM (Second Contract)	2,000,000	ST. CATHERINES (Remodelled)	250,000
WINDSOR STREET WORKS, BIRMINGHAM (Second Contract)	2,000,000	KINGSTON, PA.	125,000
HALIFAX	1,000,000	PETERBOROUGH, ONT.	250,000
TORONTO	250,000	WILKESBARRE, PA.	750,000
OTTAWA	250,000	ST. CATHERINES (Second Contract)	250,000
		BUFFALO, N.Y.	2,000,000
		WINNIPEG, MAN.	500,000

COLCHESTER (Second Contract) 300,000 Cubic Feet.

spurt, benzols have again relapsed; and the outlook is most discouraging. Pitch is firm; and for next season higher prices are asked.

Values during the week may be taken as follows: Tar, 11s. 6d. to 14s. 6d. Pitch, 21s. 6d., East Coast; 18s. 6d., West Coast. Benzols, 90's, 1s.; 50's, 1s. 1d. Toluol, 1s. 3½d. Solvent naphtha, 1s. 3d. Heavy naphtha, 1s. 3d. Crude, 30 per cent., naphtha, 4¾d. Creosote, 2¾d. Heavy oils, 50s. Carbolic acid, 60's, 2s. Naphthalene, 52s. 6d.; salts, 32s. 6d. Anthracene, "A," 5d.; "B," 4d.

Sulphate of Ammonia shows further signs of improvement; and there are buyers in all positions at about £9 5s. to £9 7s. 6d. per ton, less 3½ per cent., with a good inquiry for forward delivery.

COAL TRADE REPORTS.

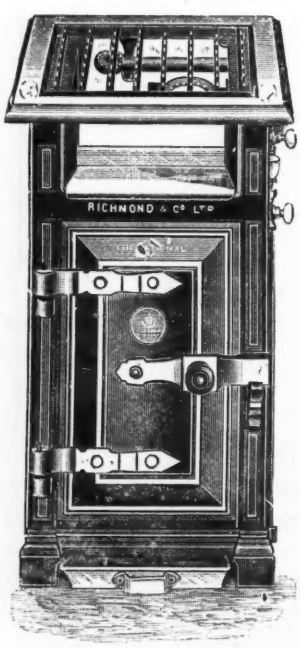
From Our Own Correspondents.

Lancashire Coal Trade.—Apart from some slackening off in the demand for house-fire requirements, and a lessening in the recent special pressure for shipment, there is no very material change to report in the position generally throughout the coal trade of this district. The better qualities of round coal move off moderately, at about list rates. Steam and forge coals are in fairly active request, with the recent improvement in prices generally maintained; and though some of the inferior sorts of slack are more plentiful in the market, engine fuel is for the most part moving away without much difficulty, and prices are steady at about recent quotations. At the pit mouth, best Wigan Arley coals average about 10s. to 10s. 6d. per ton; Pemberton four-feet and seconds Arley, 8s. 6d. to 9s.; common round coals, from 6s. 6d. to 7s. 6d.; and engine fuel, from 3s. 3d. to 3s. 6d. for common; 3s. 9d. to 4s. 3d. for medium, up to 4s. 6d. and 4s. 9d. for the better qualities. These figures represent the average prices on current sales. With regard to forward contracts, it is as yet difficult to arrive at any really reliable basis. One or two gas coal contracts have been placed at an advance of 6d. to 9d. per ton on last year's prices; and colliery proprietors generally seem determined to hold out for an advance on something like this basis upon contracts that have yet to come forward. The railway companies have not sent out their usual inquiries for locomotive fuel; the settlement of these contracts being held over much later than in previous seasons. Colliery proprietors in the meantime are maintaining a decidedly firm attitude with regard to prices; and an advance of 1s. per ton upon last season's very low contract rates is the figure that is mostly talked of. When contracts for engine fuel come upon the market, the prices quoted are also in advance of last year—generally to the extent of 3d. to 6d. per ton. The outlook, as previously reported, all tends in the direction of a decided upward move in prices for next year's contracts, due partly to increased cost owing to the Workmen's Compensation Act, and also to the movement among the miners for an advance in wages; while the position of colliery owners themselves has been decidedly strengthened by the South Wales dispute, which has cleared away a good deal of stock that would otherwise have remained on hand during the summer season. In the shipping trade, there is still a fairly good demand, with prices ranging from 8s. 9d. to 9s. 3d. per ton for good ordinary qualities of steam coal, delivered at the ports on the Mersey.

Northern Coal Trade.—There is still considerable briskness in the coal trade of the North; and it seems likely to continue for some time. It is chiefly in the steam coal trade; but it is also more slightly shown in the gas coal branch, for some orders usually supplied by the South are now diverted to this district. Best Northumbrian steam coals are about 13s. 3d. per ton f.o.b.; second-class coals, 12s.; and steam smalls, 4s. 6d. to 4s. 9d. In regard to gas coals, the demand is naturally low at this season of the year, but there is some additional business, and the shipments to the Baltic ports are commencing in earnest. No decision has been come to yet as to the large contracts of the Newcastle Gas Company; there being a rather wide margin between the prices asked, and what is thought by the buyers to be fair. On the whole, it is probable that the prices quoted will have to be reduced before the contracts are entered into. In manufacturing coals, the demand is fairly good. Gas coke is unaltered in price; but heavier shipments are being made, and with a limited output the stocks are reduced.

Scotch Coal Trade.—The effect of the Welsh coal war seems to be passing away from the Scotch market, so far as prices are concerned. There is still, however, a much increased demand; last week's deliveries having been the largest on record. Prices are, as a matter of fact, coming down, the occasion for which is supposed to lie in the desire of Scotch coalowners to secure forward contracts before Wales again becomes a serious competitor. The prices quoted are: Main, 8s. 3d. to 8s. 6d. per ton f.o.b. Glasgow; ell, 9s. to 9s. 6d.; splint, 8s. 6d. to 8s. 9d. The shipments for the past week amounted to 246,027 tons—an increase of 33,569 tons over the previous week, and of 93,670 tons over the corresponding week of last year. For the year to date, the shipments have amounted to 2,975,193 tons—an increase over the same period last year of 346,681 tons.

The Assessment of the Swansea Gas-Works.—The Chairman of the Finance Committee of the Swansea Corporation (Mr. Rocke), in moving the adoption of the minutes of the Committee at the meeting of the Town Council last Wednesday, referred to the assessment of property in the borough, in connection with a resolution which had been passed calling upon the Assessment Committee to consider the question. He said it was to the interest of every ratepayer in Swansea that the assessment should be as high as possible, so long as it was fairly and equally distributed. A rise of £100,000 in the assessment would simply mean that the rates, instead of being 8s. 1½d., would be only 5s. 9d. in the pound. Comparing the assessment of the gas-works at Swansea with similar undertakings at Cardiff, he showed that the latter were rated very low. The gas-works in Swansea were only assessed at £4451, against £13,993 for the Cardiff works. They knew what the Swansea Gas-Works were worth—at any rate, they knew the value the Company put on them, because they tried to buy them; and he took it they should be prepared to take this valuation for the basis of assessment.



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The Price of Gas at Leeds.—At the meeting of the Leeds Corporation Gas Committee last Thursday, Mr. Brown announced that he intended to move a resolution at the next meeting of the City Council that the price of gas be reduced from 2s. 2d. to 2s. 1d. per 1000 cubic feet.

Hebden Bridge Gas Profits.—The annual report of the Hebden Bridge Gas Board states that a gross profit of £3952 was made on the past year's working. After providing for the dividend on the 3 per cent. redeemable stock (amounting to £2319), interest on mortgage loans £45, and setting apart £987 for redemption and sinking fund account, there remained a net profit of £601 to be carried forward.

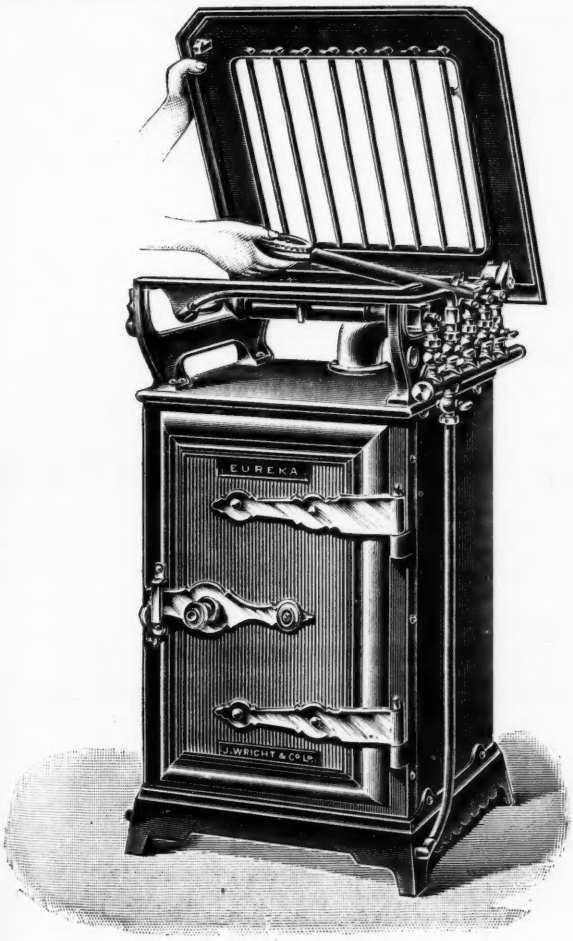
The Welsh Water Scheme of the Birmingham Corporation.—At the last monthly meeting of the Birmingham Association of Mechanical Engineers, Mr. E. A. Lees, the Secretary of the Birmingham Corporation Water Department, read a paper on the Welsh water scheme. In a survey of the work as a whole, Mr. Lees spoke of the aqueduct from the Elan Valley to Birmingham. The methods of construction, he said, were tunnel, cut-and-cover, and syphon or pipe-line. There were to be nine tunnels in all, with a length of 13⅓ miles; of the cut-and-cover method, there would be seventeen sections, with a length of 23 miles; and of the syphon or pipe-line, there were to be eleven sections, with a total length of 37 miles. Turning to the gigantic reservoirs now in construction in the Elan Valley, Mr. Lees said there was nothing so far to lead them to suppose that the time-limit for the completion of the works—June, 1902—would be exceeded. Very much had been accomplished; and a retrospective view of what had been done gave every encouragement to advance upon what still remained.

St. Mary Church Gas-Works.—A statement of the position of the gas-works at the end of the last financial year was recently presented to the St. Mary Church District Council by Mr. H. Grant, the Chairman of the Gas Committee. It showed that 20¼ million cubic feet of gas had been made and 15⅛ millions sold. The unaccounted-for gas was 20 per cent. —probably caused by the gas passing direct from the retorts to the holders. The Manager proposed an arrangement by which this might be avoided. Of the gas sold, 9⅛ million feet were for private lighting, 3⅛ millions for cooking and heating, and 1½ millions for public lighting. They sold 750,000 cubic feet through automatic prepayment meters, which yielded a revenue of £115. They also received £490 for gas sold for cooking. The wisdom of their policy in regard to both the prepayment meters and the cooking-stoves was thus evident. The increase in the sale of gas was 750,000 cubic feet. The total income was £3457, including £2827 for gas-rents and £514 for coke and tar. The expenditure was £2459; leaving a profit of £998. From the credit balance of £1599 which they had at the end of the year, they paid £400 on sinking fund and £227 as interest; leaving £932 to be carried forward. He hoped it would soon be possible to further reduce the price of gas. The sum originally borrowed for the gas-works was £12,000; and they had reduced this to £5900. If the undertaking had belonged to a private company, it would have paid a dividend of 12⅛ per cent. during the past year. This was eminently satisfactory, and was the result of the excellent management of the works.

Stafford Corporation Gas and Electricity Supply.—At the meeting of the Stafford Town Council last Tuesday, the Gas and Electricity Committee presented their annual report. It showed that the gross profit on the gas-works during the past financial year was £7285, and the net profit £1602, of which £1500 was transferred to the district fund in aid of the rates. The gross profit on the working of the electric lighting department was £527. About 4⅜ million cubic feet more gas had been sold; while the increase in the sale of electric current had been 27 per cent. The report was adopted. The Engineer (Mr. J. Ferguson Bell) was awarded a bonus of £250, in consideration of extra duties he had performed through the establishment of the electric lighting works.

The Proposed Purchase of the Truro Water-Works.—Correspondence relating to the proposal of the Truro City Corporation to purchase the undertaking of the Truro Water Company, was laid before a meeting of the City Council last week. The Town Clerk wrote to the Company asking if they were prepared to sell their undertaking, and upon what terms. The Secretary (Mr. Arthur E. Adams) replied that the Directors were not aware that there was any desire on the part of the shareholders to dispose of the property; but that if the Council would state the basis upon which they were prepared to treat for the purchase, it should be laid before the shareholders. The Water Committee brought forward a scheme by which the terms of purchase were to be submitted to arbitration. Under this proposal, the Corporation are to appoint one able and practical surveyor, and the Company another, to determine the value of the undertaking, with power, in the event of their not agreeing, to nominate a third surveyor and expert. If this proposal is accepted by the Company, a formal contract is to be entered into for its execution; the Corporation undertaking, immediately upon its execution, to apply for the sanction of the Local Government Board to the fulfilment of their part of it. The scheme was approved by the Council; and it will be sent to the Company.

The Water Supply of Peterborough.—The report of the Engineer of the Peterborough Corporation Water-Works (Mr. J. C. Gill) for 1897 shows that the income amounted to £7563, and the expenditure to £2387; leaving a profit of £5176. Regarding the consumption of water, Mr. Gill states that a considerable saving has been effected by the use of the Deacon waste-water meter system (this being the first year of its operation in the borough). Though 240 more houses have been connected, the quantity of water actually required has been reduced by 26,559 gallons per day. He has great faith in this system of detecting waste, and estimates that, when the whole of the borough is brought under the control of the meters, the probability is that sufficient water will have been saved to provide for the ordinary increase of consumption for some years to come. The water delivered into Peterborough during the year was distributed as follows: Total quantity pumped, 515,470,870 gallons; consumed by the Railway Companies, 210,406,634 gallons; consumed by other meter supplies, 36,334,987 gallons; used for domestic purposes, waste, and flushing, 268,729,249 gallons. Taking the population at 30,000, the total quantity of water supplied equals 47 gallons per head daily. Of this 19 gallons are used by the railways; leaving 28 gallons per head per day for all other purposes.



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Newtown (Mon.) Water-Works Purchase Question.—The Newtown Water Company have withdrawn their opposition to the Bill which the District Council have in Parliament for giving them authority to purchase the Company's works. It seems that, after some negotiation, the Company agreed to take this step on payment by the Council of £300 towards the costs which they have incurred and two years' salary for the Manager as compensation. The price to be paid for the works will be settled by arbitration.

Johannesburg Water Supply.—The Johannesburg Water-Works Company, who have for a long time been spending money lavishly on new works at Luurbekom, have been rewarded by striking immense caverns full of water, which are expected to yield a daily supply ranging up to 15 million gallons. If this estimate should prove correct, it will solve the water difficulty in the Rand. Such a supply would, it is confidently stated, amply suffice not only for domestic requirements but also for the needs of the mining industry.

The Staines Water-Works Arbitration.—Mr. A. R. Stenning, the Umpire in the arbitration proceedings between Sir Charles Gibbons, Bart., and the Staines Reservoirs Joint Committee, in respect of land taken by them for the purposes of their scheme, has made his award. It may be remembered (see *ante*, p. 1025) that the claim was for £35,000; and something like this figure was put down by the owner's valuers. Those for the Committee, however, gave about £10,350 as the amount of the compensation which they thought should be paid. The Umpire has awarded £20,245; the Committee to carry out certain necessary works in addition.

Southampton Water-Works Extensions.—At the Municipal Offices, Southampton, on Wednesday last, Colonel Marsh held an inquiry respecting (among other things) an application made to the Local Government Board by the Southampton County Borough Council to borrow £28,428 for water-works purposes. This sum was made up as follows: New 24-inch main from the Otterbourne reservoir, £19,700; driving additional headings at the station, £900; two additional kilns, £400; the Northam main, £2300; renewals of street mains, £5078; and mains in Wilton Street, £50. The Water Engineer to the Corporation (Mr. W. Matthews) explained the plans to the Inspector; and there being no opposition, the next subject of the inquiry was proceeded with.

Salford Corporation Electrical Works.—The Salford Town Council last Wednesday adopted the plans for the erection of a new generating station at the electricity works, at an estimated cost of £28,161. The Chairman of the Gas Committee (Mr. A. Haworth) stated that they were considering plans for the application of electric traction to the tramways; and as they had already gone as far as they dared in supplying the current to consumers, they had to decide between extending the old station and erecting a new one. He believed that, unless perhaps for the first year, the proposed new station would not entail any charge on the rates; for, as soon as they commenced working, interest and sinking fund would be provided out of the revenue. The electricity works were making gratifying progress; and the loss during the past year had been reduced by £900.

The Basis of the Charges of the Portsmouth Water Company.—The Water Committee of the Portsmouth Corporation seem to be determined to bring to an issue the important question whether the Water Company have the right to base their charges on the full annual rental of premises to which their supply is laid. Two eminent Counsel have assured the Corporation that the Company have no legal right to levy upon the full value, but only upon the assessed value; while another equally eminent Counsel is inclined to the opposite opinion. The Committee recently decided to recommend the Town Council to give the Company notice to the effect that they will in future decline to pay any charges of the Water Company in respect of property belonging to the Corporation unless such charges are based on the rateable value of the property. Should the Company refuse to agree to these terms, a test case will in all probability be taken before the Courts; and the matter thoroughly thrashed out.

The Leeds Fire-Clay Company, Limited, have obtained contracts for their shallow regenerator settings for the Ripon, Yarm, and Market Deeping Gas-Works.

The Lamp Manufacturing Company, Limited, held their fourth annual meeting last Thursday. A dividend on the preference shares of 7 per cent. was declared, and a balance of £1250 carried forward.

Arrangements have been made by the Welsbach Company for a series of exhibitions of their new burner in Bristol, Birmingham, Cardiff, Exeter, Leeds, Leicester, Liverpool, Manchester, Newcastle, Sheffield, Belfast, Edinburgh, and Glasgow. The first was opened yesterday in Bristol. They will be under the direction of Mr. J. H. Sheldrake, who carried out the recent exhibition of the burner at Niagara Hall.

The Hague School of Cookery, which was founded by Madame Alting-Mees about ten years ago, is doing good work. The foundress recently lectured there by Royal invitation; and the hall was crowded by the lady members of the leading families. Nine schools of cookery and domestic economy have sprung from the original institution; and they are all flourishing, and contributing to the popularization of the use of gas as a fuel. Madame Alting-Mees used for her demonstrations a gas cooker by an English maker.

At the new works which Messrs. Willey and Co. are constructing at Exeter, an important feature is an installation of compressed-air machinery, which will be brought into effective use for riveting and painting gasholders. Something like £20,000 worth of engineering work is in progress at this establishment; including a large number of chandeliers and pendants for The Gaslight and Coke Company, and an order for prepayment meters from the Exeter Gas Company. A branch of the business has just been opened at Cardiff.

Exhibitions of gas apparatus have lately been held by the following firms: Messrs. Fletcher, Russell, and Co., at Newcastle-upon-Tyne, with lectures by Mrs. H. M. Young and Miss E. E. Golding. Messrs. W. Parkinson and Co., at Charlton-cum-Hardy, with lectures by Miss Sanderson. Messrs. Richmond and Co., at Edinburgh, Higher Tranmere, Huddersfield, Longsight, Rathmines, and Swansea, with lectures by Mrs. Middleton, Miss Richmond, Miss Smallwood, Miss Dennell, Miss Dudgeon, and Mrs. Bradshaw. Messrs. R. & A. Main, Limited, at the following places in the Manchester district: The Broughton Town Hall, the Trafford Road Liberal Club, the Moss Side Liberal Club, the Pendlebury Blue Ribbon Hall, the Harpurhey Conservative Hall, the Pendleton Town Hall, the Eccles Town Hall, and the Singleton Mission Hall, Broughton; also at the Congregational School, Bolton.

WHITSUN HOLIDAY.

NOTICE TO ADVERTISERS.—In consequence of the WHITSUN HOLIDAY, orders with respect to ADVERTISEMENTS should be received at the Office *not later* than THE FIRST POST ON SATURDAY NEXT.

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[For Illustrated Advertisement, see May 3, p. 1039.]

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Address No. 3064, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

INSTITUTION OF CIVIL ENGINEERS.

FOR SALE—Minutes of Proceedings from 1872-3 to 1896-7; 95 Volumes, in good condition.
Offers to be addressed to No. 3063, care of Mr. King, 11, Bolt Court, FLEET STREET, E.C.

FOR SALE—Sulphate of Ammonia PLANT, suitable for Works Carbonizing 4000 Tons of Coal per annum. Built by Abbott & Co., London.
Apply to the CLIFTON AND KERSLEY COAL COMPANY, LIMITED, Clifton, near MANCHESTER.

SECOND-HAND 2-feet Station Governor FOR SALE, with Counterbalance Weights, and three 6-inch DONKIN VALVES, and a 3-inch DONKIN VALVE for Bye-Pass, with Connections complete for 6-inch Main. In good condition.
Address SECRETARY, Gas-Works, Calne, WILTS.

GAS PLANT for Sale—I can always offer NEW and SECOND-HAND GAS APPARATUS, including Retorts and Fittings, Condensers, Exhausters, Scrubbers, Washers, Purifiers, Gasholders, Tanks, Valves, Connections, &c. Also a few COMPLETE WORKS. **Compare Prices and Particulars before ordering elsewhere.**
J. F. BLAKELEY, Gas Engineer, Ravensthorpe, YORKS.

CITY OF CARLISLE.

THE Carlisle Gas Committee are prepared to receive TENDERS for the COAL and CANNEL required at their Works during One Year from the 1st of July next.
Tenders to be delivered to the undersigned not later than June 6, 1898.
Forms of Tender and other Particulars on application.

C. B. NEWTON,
Engineer and General Manager.

Gas-Works, Carlisle,
May 20, 1898.

CITY OF CARLISLE.

THE Carlisle Gas Committee are prepared to receive TENDERS for the surplus TAR produced at their Works for a period of One Year from the 1st of July next.
Tenders to be delivered to the undersigned not later than June 6, 1898.
Further Particulars can be obtained on application.

C. B. NEWTON,
Engineer and General Manager.

Gas-Works, Carlisle,
May 20, 1898.

COUNTY BOROUGH OF OLDHAM.

THE Gas-Works Committee invite TENDERS for the TAR and AMMONIACAL LIQUOR to be produced at their different Gas Stations for a period of One or more Years, commencing the 1st of July next.
The yearly make of Tar is about 7200 Tons; and of Ammoniacal Liquor, about 2,500,000 gallons.
Particulars and Forms of Tender can be obtained on application to Mr. Arthur Andrew, Gas and Water Office, Oldham, to whom Tenders are to be sent on or before Tuesday, June 7.

A. NICHOLSON,
Town Clerk.

Oldham, May 23, 1898.

HAWORTH URBAN DISTRICT COUNCIL.

THE Gas Committee of the above Council are prepared to receive TENDERS for 600 yards of 9-inch plain SOCKET PIPES, 9 feet long (each Pipe not to weigh more than 4 cwt.), delivered at Oxenhope Station.

Tenders, endorsed "Pipes," to be sent to me not later than the 3rd of June next.

The Council do not bind themselves to accept the lowest or any Tender.

By order,
WM. ROBERTSHAW,
Clerk to the Council.

Burlington Chambers, Keighley.

HAWORTH URBAN DISTRICT COUNCIL.

THE Gas Committee of the above Council are prepared to receive TENDERS for a DOUBLE-LIFT GASHOLDER.

Plans and Specification may be seen at the Gas-Works on application to Mr. J. H. Whittell, Gas Manager.

Tenders, endorsed "Gasholder," to be sent to me later than the 3rd of June next.

The Council do not bind themselves to accept the west or any Tender.

By order,
WM. ROBERTSHAW,
Clerk to the Council.

Burlington Chambers, Keighley.

URBAN DISTRICT COUNCIL OF BUXTON.

TENDERS FOR TAR AND LIQUOR.

THE Buxton District Council invite TENDERS for the purchase of the surplus TAR and LIQUOR produced at their Works in Ashwood Dale, for One Year, commencing from the 30th of June next.

Further Particulars and Forms of Tender to be obtained of Mr. G. Smedley, Gas Office, Buxton.

Tenders, endorsed "Tender for Tar and Liquor," to be addressed to the Chairman of the Gas Committee, and delivered not later than Twelve Noon on the 1st of June.

The Council do not bind themselves to accept the highest or any Tender.

By order,
JOSIAH TAYLOR, Clerk.

Town Hall, Buxton,
May 12, 1898.

URBAN DISTRICT COUNCIL OF BUXTON.

TENDERS FOR GAS COAL.

THE Gas Committee invite Tenders for the supply of good GAS COAL, for one or more Years, at the rate of about 4000 Tons per annum, to be delivered at their Siding (on the Midland Railway) in Ashwood Dale, Buxton.

Tenders, endorsed "Tender for Gas Coal," addressed to the Chairman of the Gas Committee, to be delivered at the Town Hall, not later than Noon on the 4th of June.

Forms of Tender and other Particulars may be obtained of Mr. G. Smedley, Engineer, Gas Department, Town Hall, Buxton.

The Council do not bind themselves to accept the lowest or any Tender.

By order,
JOSIAH TAYLOR, Clerk.

Buxton, May 12, 1898.

BOROUGH OF DONCASTER.

TENDERS FOR COAL.

THE Gas Committee of the Borough of Doncaster are prepared to receive TENDERS for the supply of 16,000 Tons of best Screened GAS COAL during a period commencing July, 1898, and terminating the 30th of June, 1899.

Particulars and Tender Forms may be obtained on application to John Athron, Esq., Chairman, or to the undersigned.

Tenders should be sent under seal, to the Chairman, endorsed "Tender for Coal," not later than Ten a.m., on Wednesday, the 8th of June next.

By order of the Gas Committee, who do not bind themselves to accept the lowest or any Tender.

RT. BRIDGE,
Engineer.

Gas-Works, Doncaster,
May 18, 1898.

SUTTON-IN-ASHFIELD URBAN DISTRICT COUNCIL.

(GAS DEPARTMENT.)

TENDERS FOR GAS COAL AND CANNEL.
TENDERS FOR TAR AND AMMONIACAL LIQUOR.

COAL.

THE Gas Committee of the above District Council are prepared to receive TENDERS for the supply of 600 Tons of CANNEL and 3000 Tons of well-screened GAS COAL, to be free from Shale and Pyrites, and to be delivered at the Town Station (Midland), Sutton-in-Ashfield, in such quantities as the Manager shall from time to time direct, between July 1, 1898, and June 30, 1899.

TAR AND LIQUOR.

TENDERS for the surplus TAR and AMMONIACAL LIQUOR produced at their Works from July 1, 1898, to June 30, 1899.

Tenders for Coal to state price per ton of 20 cwt. at the Works, or at Sutton Town Station (Midland).

No Tender Forms provided.

The Committee do not bind themselves to accept the lowest or any Tender.

Tenders, endorsed, to be addressed as under, so as to arrive not later than the 2nd day of June, 1898.

By order,
JOHN D. FIDLER,
Clerk.

District Council Offices,
Sutton-in-Ashfield, Notts.,
May 20, 1898.

ROYAL BURGH OF RENFREW.

(GAS DEPARTMENT.)

THE Town Council invite Tenders for the supply, delivery, and erection of a 98 feet diameter and 21 feet deep SINGLE-LIFT GAS-HOLDER prepared for Telescoping; and the supply, delivery, and erection of a CAST-IRON TANK, 102 feet diameter and 20 feet deep.

Plans of proposed Holder may be seen and Specifications obtained (on payment of 10s. 6d., which will be returned on receipt of a *bonâ-fide* Tender) on application to the undersigned.

Offers, endorsed "Tender for Gasholder," to be lodged with John M'Laren, Town Chamberlain, on or before Friday, the 3rd of June.

The Commissioners do not bind themselves to accept the lowest or any Offer.

THOS. LIGHBODY,
Engineer and Manager.

Gas-Works, Renfrew,
May 20, 1898.

SELBY URBAN DISTRICT COUNCIL.

THE above Council are prepared to receive TENDERS for the following Contracts:—

CONTRACT No. 1.

For the construction and erection of a GASHOLDER 98 ft. diameter by 25 ft. deep, with Cup, and Steel Tank, 102 ft. diameter and 25 ft. 6 in. deep, together with Brick and Stone Piers and Foundations.

CONTRACT No. 2.

For the supply of MATERIALS and erection of a PURIFIER-HOUSE, 90 ft. by 32 ft.; PURIFIER FOUNDATIONS; METER-HOUSE, 30 ft. by 16 ft. For the PIPING of a DRAIN with 30-inch Sanitary Pipes, 171 ft. long; laying 254 feet of 9-inch diameter open-jointed DRAIN; and BOUNDARY WALL 7 ft. high, 150 yards long.

CONTRACT No. 3.

For the supply and erection of four PURIFIERS, 16 feet square, 12-inch diameter CENTRE-VALVE and Connections and Lifting Gear.

Drawings and Specifications may be obtained of the undersigned, to whom sealed Tenders are to be addressed on or before June 6, 1898.

By order of the Council,
W. J. MOTT,
Engineer and Manager.

COUNTY BOROUGH OF HUDDERSFIELD.

TENDERS FOR GAS COAL AND NUTS.

THE Gas Committee are prepared to receive TENDERS, from Colliery Proprietors only, for the supply and delivery of about 50,000 Tons of UNSCREENED GAS COAL and SCREENED NUTS for a period of Twelve Months, commencing the 1st of January, 1899.

Full Particulars and Form of Tender may be obtained on application to the Gas Engineer and Manager, Mr. E. A. Harman, Gas-Works, Huddersfield.

Sealed Tenders, endorsed "Tender for Gas Coal," must be delivered free of charge, addressed in the handwriting of the tenderer or his agent, to the Town Clerk, Town Hall, Huddersfield, and delivered not later than Saturday, the 28th May, 1898.

The Corporation do not bind themselves to accept the lowest or any Tender.

By order,
F. C. LLOYD,
Town Clerk.

Town Hall, Huddersfield,
May 11, 1898.

COUNTY BOROUGH OF HUDDERSFIELD.

TO TAR DISTILLERS, &c.

THE Gas Committee of the Corporation of Huddersfield are prepared to receive TENDERS for the surplus TAR produced at their Works for Twelve Months, from the 1st of July, 1898, or such other terms as may be agreed upon.

Particulars respecting quantity, &c., may be had on application to the Gas Engineer and Manager, Mr. E. A. Harman, Gas-Works, Huddersfield.

Sealed Tenders, endorsed "Tender for Tar," must be delivered, free of charge, addressed in the handwriting of the tenderer or his agent, to the Town Clerk, Town Hall, Huddersfield, and delivered not later than Saturday, the 28th May, 1898.

The Corporation do not bind themselves to accept the highest or any Tender.

By order,
F. C. LLOYD,
Town Clerk.

Town Hall, Huddersfield,
May 11, 1898.

UXBRIDGE AND HILLINGDON GAS CONSUMERS' COMPANY.

GAS COAL.

THE Directors of the above Company invite TENDERS for the supply of 4500 Tons of GAS COAL, deliveries of which are to commence the first week of July, 1898, and finish the last week in May, 1899.

Tenders to be made out for 1000 Tons of best South Yorkshire unscreened Silkstone Gas Coal, delivered in Trucks (free) at Uxbridge Railway Station, G.W.R., each Ton to contain 20 cwt., and 3500 Tons of the best description of unscreened Gas Coal from the Durham Coal-Fields, delivered by Barge (free) alongside the Company's Works, Grand Junction Canal.

Tenders are to state the names of the Pits from which the above description of Coal will be supplied; the same to be fresh wrought, and free from Slate and other Impurities, and to the entire satisfaction of the Company's Engineer.

Deliveries to be according to the requirements of the Company.

Tenders to be received on or before the 9th day of June next, addressed to the Chairman, Gas Company's Offices, Uxbridge, Middlesex, and endorsed "Tender for Coal."

A Form of Tender will be sent on application.

W. M. GARDINER,
Secretary.

Uxbridge, Middlesex,
May 19, 1898.

TENDERS FOR COAL AND CANNEL.

THE Directors of the Seaford Gas Com- pany invite TENDERS for about 1000 Tons of GAS COAL and 80 Tons of CANNEL, delivered free within Twelve Months at Seaford Station, L.B. & S.C. Railway Company, in quantities of 10-Truck Loads, as required. No Forms.

Tenders to be delivered not later than June 14, and addressed to the SECRETARY, Gas-Works, SEAFORD.

URBAN DISTRICT COUNCIL OF STOURBRIDGE.

(GAS DEPARTMENT.)

TENDERS FOR GAS COAL.

THE Gas Committee invite Tenders for 12,000 Tons of good screened GAS COAL or NUTS, or any part thereof, for delivery in equal Monthly quantities during the Year ending June 30, 1899.

Forms of Tender may be obtained on application to the Manager.

Sealed Tenders, endorsed "Tender for Gas Coal," to be addressed to the Chairman of the Gas Committee, and delivered to the undersigned on or before Monday, June 13, 1898.

W. NORTH,
Engineer and Manager.

Gas-Works, Stourbridge,
May 21, 1898.

CRYSTAL PALACE DISTRICT GAS COMPANY.

TENDERS FOR TAR.

THE Directors of the above Company invite TENDERS for the whole or any portion of any surplus TAR—say, 1 million gallons—made at these Works during the Year from the 1st day of July next to the 30th of June, 1899. The Tar can be taken by Road or Rail from the Company's Siding.

Price to be quoted both per gallon and per ton.

Tenders to be addressed to the Chairman of the Company, and forwarded to these Offices on or before the evening of the 9th day of June next.

Conditions of Contract and any further Information may be obtained on application.

The Directors reserve the right to accept the Tende of any one or more Contractors, at their option, and do not bind themselves to accept the highest or any Tender.

By order of the Board,
CHARLES M. OHREN,
Secretary.

Offices and Works:
Lower Sydenham, London, S.E.,
May 23, 1898.

SHREWSBURY GASLIGHT COMPANY.

TENDERS FOR COAL.

THE Directors of the Shrewsbury Gas- light Company invite TENDERS for the supply of about 12,000 Tons of Screened GAS COAL, and about 1000 Tons of good ENGLISH CANNEL, to be delivered free at the Great Western or London and North-Western Goods Yard, Shrewsbury, during One, Two, or Three Years, commencing July 1, 1898.

The Directors reserve to themselves the right to divide the quantity into two or more Contracts, and do not bind themselves to accept the lowest or any Tender.

Tenders must be made on Forms (containing further Particulars) which may be obtained on application at the Company's Works, or by post, and must be sent to the undersigned, on or before the 17th day of June, 1898.

By order,
WM. BELTON, Assoc.M.Inst.C.E.,
Secretary and Manager.

Gas-Works, Shrewsbury,
May 18, 1898.

SCARBOROUGH GAS COMPANY.

TAR AND AMMONIACAL LIQUOR.

THE Directors of the Scarborough Gas Company invite TENDERS for the surplus TAR and the whole of the AMMONIACAL LIQUOR, to be produced at their Works for One or more Years from the 1st day of July next.

Tenders for Liquor may be submitted either at a fixed Price per Ton or on a Sliding-Scale, regulated by the price of Sulphate. Preference will, however, be given to the latter.

Further Particulars may be obtained on application to the undersigned, to whom sealed Tenders (duly endorsed) must be delivered not later than Noon, on Saturday, the 11th of June next.

The Directors do not bind themselves to accept the highest or any Tender.

By order of the Board,
(Signed) J. HOLLIDAY,
Engineer and Secretary.

Gas Offices: 32, Westborough,
Scarborough, May 18, 1898.

RHONDDA URBAN DISTRICT COUNCIL.

(GAS AND WATER DEPARTMENT.)

THE above Council are prepared to receive TENDERS for the following:—

(1) Installations of Mr. W. R. CHESTER'S RE-GENERATOR FURNACES, with all the necessary Ironwork at Porth and Ystrad Gas-Works.

(2) CAST-IRON PIPES required during the next Twelve Months.

The Drawings, Specifications, and Forms of Tender may be seen on application to Mr. Octavius Thomas, the Engineer and Manager, Gas and Water Offices, Pentre, R.S.O., Glam.

Tenders to be addressed to the Chairman of the Gas and Water Committee, marked respectively "No. 1" and "No. 2," and delivered at my Office on or before Ten a.m., Friday, the 3rd of June, 1898.

The Council do not bind themselves to accept the lowest or any Tender.

WALTER H. MORGAN,
Clerk.

Council Offices, Pentre, R.S.O., Glam.,
May 20, 1898.

THE Directors of the Kildwick Parish Gas Company invite TENDERS for the supply of the whole or part of 3500 Tons of GAS COAL or NUTS, to be delivered free in the Company's Sidings at Kildwick during the Twelve Months ending June 30, 1899.

Tenders to be sent in not later than June 4, 1898.

FRED. H. PICKLES,
Manager and Secretary.

Gas-Works, Kildwick,
May 20, 1898.

THE Urban District Council of Atherton invite TENDERS for the supply of about 5000 Tons of good GAS COAL during the Twelve Months ending June 30, 1899.

Further Information and Forms of Tender may be obtained from the undersigned, who will receive Tenders (sealed and endorsed "Gas Coal") up to Noon on Wednesday, June 1.

DANIEL SCHOFIELD,
Clerk.

Atherton, May 19, 1898.

THE Gas Committee of the Borough of Newbury invite TENDERS for the supply of 2400 Tons of best GAS COAL during the Year ending June 30, 1899.

Delivery to be free to Newbury (G.W.R.) Station.

No Forms of Tender are issued; and the lowest or any Tender will not necessarily be accepted.

All Tenders, to be endorsed "Tender for Gas Coal," addressed to the Chairman, Offices of the Gas-Works, Newbury, Berks, and posted not later than Friday, the 3rd prox.

ROBERT M. COUPER,
Manager.

Gas-Works, Newbury,
May 19, 1898.

TENDERS FOR GAS COAL.

THE Directors of the Ramsey Gas Com- pany (Huntingdonshire) invite TENDERS for the supply of about 500 Tons of best screened GAS COAL, to be delivered during the ensuing Twelve Months, in quantities Monthly as may be required.

Tenders, stating Price per Ton, delivered free at Ramsey, G.N. Station, to be sent to the undersigned on or before the 2nd of June.

The Directors do not bind themselves to accept the lowest or any Tender.

WILLIAM ORRISS,
Secretary.

Ramsey, May 20, 1898.

CORPORATION OF SANDWICH, KENT.

TENDERS FOR MAIN PIPES.

THE Gas Committee of the above Cor- poration are prepared to receive TENDERS for the supply and delivery of the following MAINS:—

8-inch, 250 yards or thereabouts.
6-inch, 563 " " "
4-inch, 323 " " "
3 inch, 270 " " "

Together with any SPECIAL CASTINGS that may be required.

Specifications can be obtained from the Manager.

The Committee do not bind themselves to accept the lowest or any Tender.

Tenders to be delivered to me not later than Monday, May 30 next.

J. DONALDSON,
Manager.

Office: Quay, Sandwich.

SALES BY AUCTION OF GAS AND WATER STOCKS AND SHARES.

MR. ALFRED RICHARDS begs to notify that his AUCTIONS of STOCKS and SHARES in London, Suburban, and Provincial Gas and Water Companies are held MONTHLY, at the Mart, Tokenhouse Yard, E.C.

He also undertakes the issuing by Auction of Gas and Water Stocks and Shares under Parliamentary Powers.

Terms for issuing such Capital, and also for including Gas and Water Stocks and Shares in these periodical Sales, can be obtained on application at Mr. Alfred Richards's Offices, 18, FINSBURY CIRCUS, E.C.

By order of the Directors.

ALDERSHOT GAS AND WATER COMPANY.

MR. ALFRED RICHARDS will Sell BY AUCTION, at the Mart, E.C., on Monday, June 6, at Two o'clock, in Lots, 150 £10 ORDINARY SHARES in the above Company, ranking for a Maximum Dividend of 7 per cent.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

By order of the Directors of the

HARROW AND STANMORE GAS COMPANY.

MR. ALFRED RICHARDS will Sell BY AUCTION, at the Mart, E.C., on Monday, June 6, at Two o'clock, in Lots, 300 £10 "C" SHARES in the above Company, ranking for a Standard Dividend of 7 per cent.; the last Dividend on similar Shares having been 5½ per cent.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

STOCKS AND SHARES
IN THE
BARNET DISTRICT GAS & WATER COMPANY
AND
MELTON MOWBRAY GAS COMPANY.

MR. ALFRED RICHARDS will Sell the above BY AUCTION, at the Mart, E.C., on Monday, June 6, at Two o'clock, in Lots.

Particulars of the AUCTIONEER, 18, FINSBURY CIRCUS, E.C.

GUILDFORD GASLIGHT AND COKE COMPANY.

TO TAR DISTILLERS.

THE Directors of the above Company are prepared to receive TENDERS for the surplus TAR and CARBURETTED WATER-GAS TAR produced by the above Company for the Year ending the 30th of June, 1899. Coal Carbonized, about 12,500 Tons per annum.

All Tenders to state the price per Cask of 40 gallons. Cartage to and from Railway Station, Guildford, free. All Empties to be provided by Contractor.

Tenders, endorsed "Tar," to be sent to David Williamson, Esq., J.P., Chairman of the Gas Company, Guildford, on or before Thursday, June 2, 1898.

By order,
WM. TITLEY,
Secretary.

Gas Offices, Guildford,
May 18, 1898.

PATENTS, DESIGNS, AND TRADE MARKS ACTS, 1883 TO 1888.

NOTICE is Hereby Given, that Meters, Limited, have APPLIED FOR LEAVE TO AMEND THE SPECIFICATION OF THE LETTERS PATENT No. 7012 of 1887, granted to Rowland William Brownhill, for "An Improved Gas-Meter for Supplying Gas in Exchange for Coin or an Equivalent."

Particulars of the proposed Amendments were set forth in the "Illustrated Official Journal (Patents)" issued on the 18th of May, 1898.

Any person, or persons, may give Notice of Opposition to the Amendment (on Form G), at the Patent Office, 25, Southampton Buildings, London, W.C., within One Calendar Month from the date of the said "Journal."

C. N. DALTON,
Comptroller-General.

E. ROBINSON WALKER & SON,
Solicitors,
18, St. Ann Street, Manchester.

PRESCOT GAS COMPANY.

ISSUE OF £1500 PREFERENCE 4 PER CENT. "C" STOCK UNDER THE PRESCOT GAS ACTS, 1867 AND 1880.

NOTICE is Hereby Given, that on Friday, the 3rd day of June, 1898, the Directors will receive TENDERS for the purchase of £1500 PREFERENCE 4 PER CENT. STOCK in Fifteen Lots of £100 each, or in Lots of £10, or Multiples thereof, not exceeding £100 per Lot.

Tenders to be sent to the undersigned.

By order,
JOHN E. HALL,
Secretary.

Gas-Works, Moss Street,
Prescot, May 20, 1898.

KING'S LYNN GAS COMPANY.

Issue of £4000 PREFERENCE 4 PER CENT. STOCK under the King's Lynn Gas Order, 1888, confirmed by the Gas Orders Confirmation (No. 2) Act, 1888.

NOTICE is Hereby Given, that, on the 31st of May, 1898, the Directors will receive TENDERS for the purchase of £4000 PREFERENCE 4 PER CENT. STOCK in 40 Lots of £100 each.

Printed Conditions and Forms of Tender may be had on application, by post or otherwise, to the Manager, Gas-Works, King's Lynn, or to the undersigned.

By order,
J. J. COULTON,
F. H. PARTRIDGE, } Clerks.

Lynn, May 6, 1898.

HODDESDON GAS AND COKE COMPANY LIMITED.

SALE BY AUCTION OF 550 £5 NEW ORDINARY SHARES.

NOTICE is Hereby Given, that the Directors of this Company have instructed Mr. A. M'Kenzie to SELL BY AUCTION, at the Bull Hotel, Hoddesdon, on the 1st day of June next, at 6.30 p.m., 550 £5 SHARES, with a prescribed rate of Dividend of 7 per cent., in accordance with the Provisions of the Hoddesdon Gas Order, 1886.

Particulars and Conditions of Sale may be obtained on application to the undersigned, or of the Auctioneer, High Street, Hoddesdon.

By order,
HARRY D. DUESBURY,
Secretary.

TUNBRIDGE WELLS GAS COMPANY.

ISSUE OF
£3250
FOUR-AND-A-HALF PER CENT. DEBENTURE STOCK.

THE Directors of the Tunbridge Wells Gas Company Hereby Give Notice that on Wednesday, June 8, 1898, they will be prepared to receive sealed TENDERS for £3250 DEBENTURE STOCK, to bear Interest at the rate of 4½ per cent. per annum, to be issued under the Provisions of the Tunbridge Wells Gas Acts, and in accordance with the Resolutions adopted at the Meeting of Directors held on May 11, 1898.

The Tenders must be filled up and signed by the Applicants, and delivered in sealed envelopes at the Office of the Company, 44, High Street, Tunbridge Wells, by not later than Twelve o'clock (Noon) on Wednesday, June 8, 1898.

Full Particulars and Form of Tender can be obtained on application to the Secretary.

By order,
JOHN READ,
Secretary and General Manager.

Gas Com any's Office, Tunbridge Wells,
May 24, 1898.

HEBBURN MAIN GAS COALS.

Yield of Gas per ton . . . . . 10,500 cub. ft.
Illuminating Power . . . . . 16·4 candles.
Coke . . . . . 68 per cent.

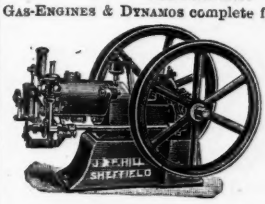
For Prices, f.o.b. Ship or Delivered by Rail, apply to

THE WALLSEND & HEBBURN COAL COMPANY, LTD.,
8 Lombard Street,
NEWCASTLE-ON-TYNE.

W. RICHARDSON, Fitter.

HILL'S IMPROVED
"OTTO" TYPE GAS-ENGINES
½ H.P. to 20 H.P. Specially designed for Users of Small Power.

GAS-ENGINES & DYNAMOS complete for HOTEL, HOUSE, and SHOP Installations.



Gas-Engines and Pumps.
High-Class Workmanship.

J. & P. HILL,
Backfields & Norfolk Iron-Works,
SHEFFIELD.

GAS PURIFICATION BY
HYDRATED OXIDE.

THIS Material is of full Strength, and Exceptional Activity. It is specially prepared to minimise Back-Pressure; and will be supplied on Hire, or Sold, on the most favourable Terms.

SPENT OXIDES containing Blue, also CRUDE FERRO-CYANIDE PRODUCTS, either PURCHASED or EXCHANGED for FRESH OXIDE.

MANCHESTER OXIDE COMPANY, LTD.,
CANAL ST., MILES PLATTING, MANCHESTER.

BOLDON GAS COALS.

ANALYSIS.

Yield of Gas per ton . .	10,500	Cubic Feet.
Illuminating Power . .	16·9	Candles.
Coke	66·7	Coke.
Sulphur	0·86	Sulphur.
Ash	2·04	Ash.

For Prices, &c., apply to

W. H. PARKINSON,
THE HARTON COAL CO., LTD.,
NEWCASTLE-ON-TYNE.

Telegraphic Address: "PARKINSON NEWCASTLE."

THE SILICA FIRE-BRICK COMPANY,
OUGHTIBRIDGE, near SHEFFIELD,
MANUFACTURE
SILICA BLOCKS, BRICKS, AND CEMENT
OF SUPERIOR QUALITY
FOR GAS-FURNACES.

Trade Mark: "SILICA."

These Goods (largely used in Gas, Glass, Iron, and Steel Works) are, on account of their
GREATER DURABILITY,
Strongly recommended where EXCESSIVE HEATS have to be maintained.

Telephone: Castleford No. 214. | Postal Address: Castleford.
Telegrams: "Silkstone Castleford."

THE SILKSTONE & HAIGH MOOR COLLIERIES, LTD.

ALLERTON BYWATER, CASTLEFORD.

Steam, Manufacturing, & Gas Coals & Cannel.

Analysis, Contracts, Trial Waggons, and Quotations for Large and Small Orders. Inquiries Solicited.

HOLMSIDE

GAS COALS.

Present Daily Produce over 5000 Tons.

Latest Analysis—By CHARLES PHILLIPS, Gas Examiner to Rotherham Corporation

Yield of Gas per Ton . . . 11,205 Cubic Feet.
Illuminating Power $16\frac{7}{10}$ Stand. Sperm. Candl.
Coke (of good & pure quality) $13\frac{3}{4}$ Cwt. per Ton.
Sulphur . . . . . A little over 1 per Cent.
Ash . . . . . Under 1 per Cent.
Tar . . . . . 163 lbs. (Avoir.) per Ton.
Ammoniacal Liquor 103 lbs. (Avoir.) per Ton.

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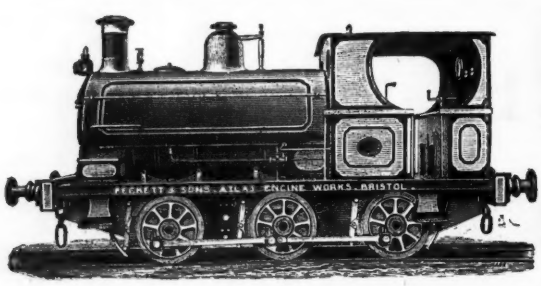

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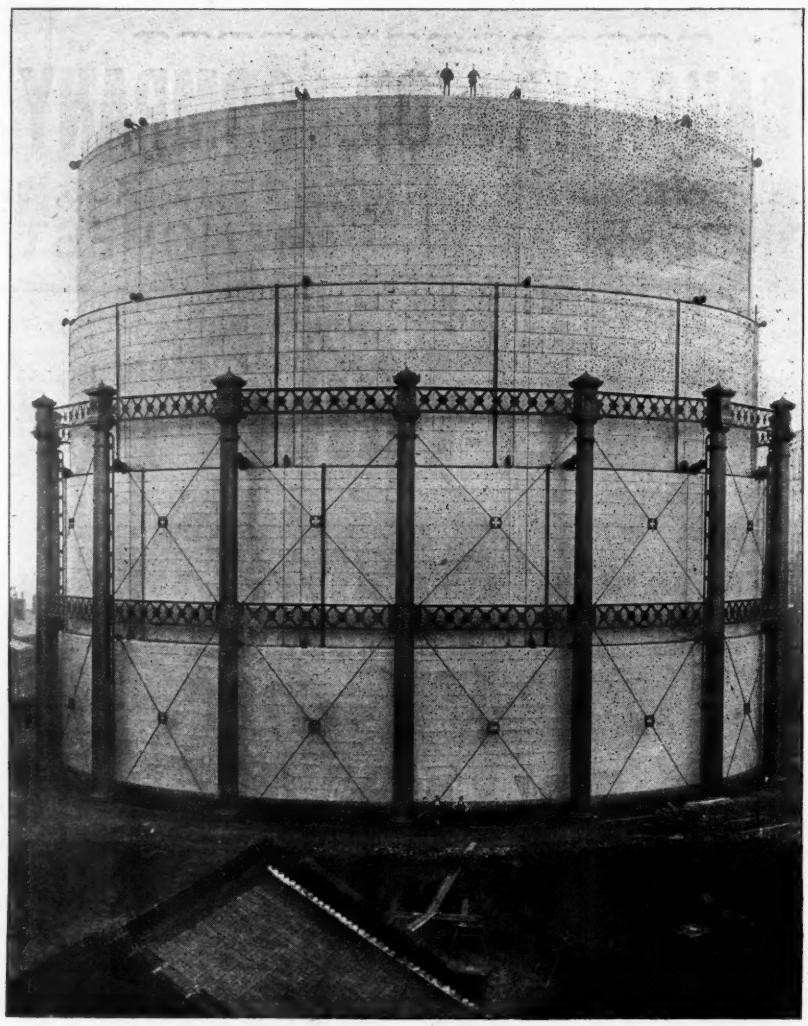

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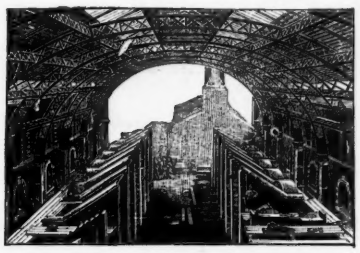

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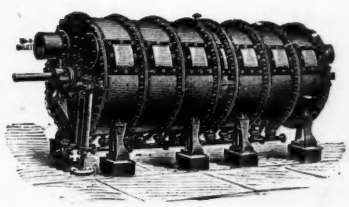

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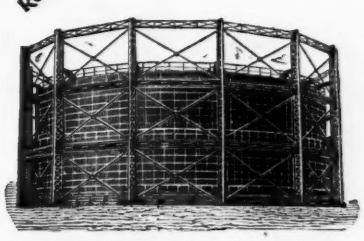

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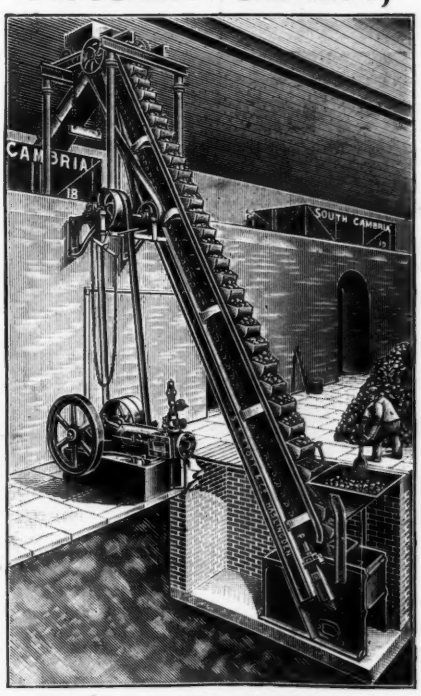

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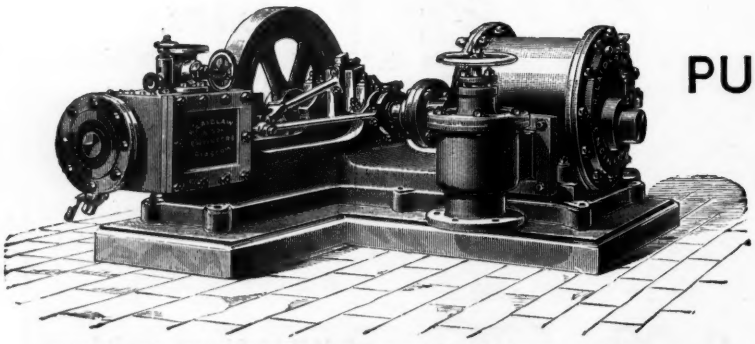

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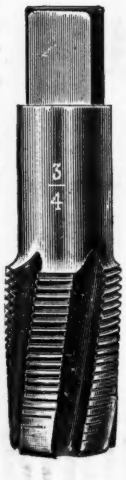

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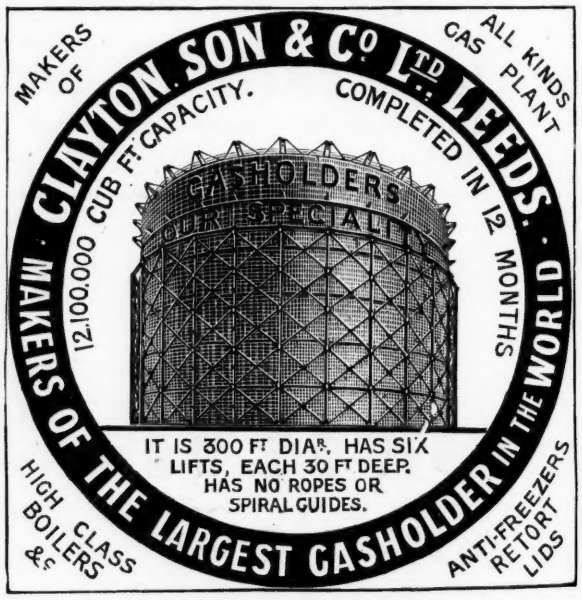
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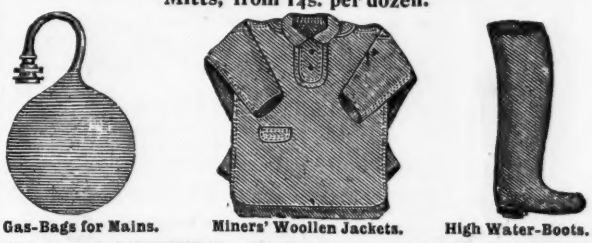

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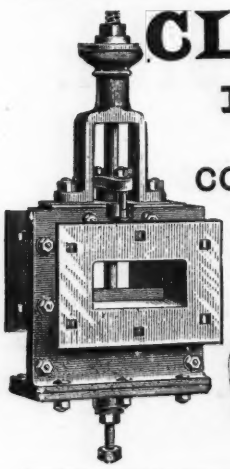

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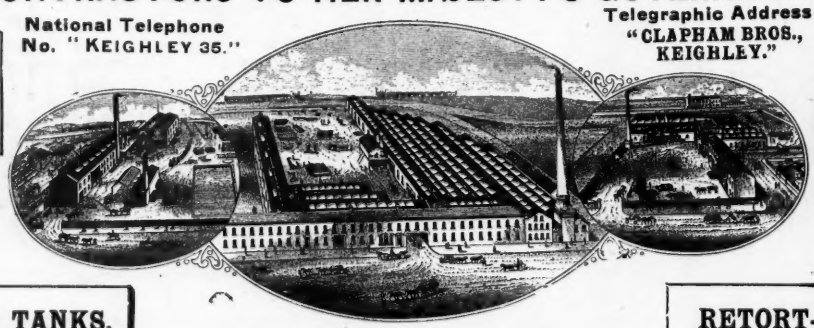

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